The RUBBER AGE

April, 1946

TECHNOLOGY DEPT.

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Agerite
Stalite

DURING the war the entire output of this new AGERITE was used in GR-S but it is now readily available for general use.

AGERITE STALITE is a free-flowing oil-like liquid, non-toxic and easily incorporated in natural or synthetic rubbers. It is an excellent all-round antioxidant and flexing improver and next to AGERITE ALBA is the least discoloring and staining of the AGERITES. It fills a distinct need in the rubber industry and is of wide application.

R. T. VANDERBILT CO., INC.
230 Park Avenue, New York City

R v.59 Apr.-Sept. 1946

Du Pont
NEWSLETTER No. 4, APRIL 1946
RUBBER CHEMICALS DIVISION
PUBLISHED BY E. I. DU PONT DE NEMOURS & CO. (INC.), WILMINGTON 98, DELAWARE

NON-AROMATIC SOLVENTS FOR NEOPRENE

NON-AROMATIC neoprene cements can be prepared which are economical, non-toxic and have a wide range of evaporation rates. Blends of ketones or acetates with aliphatic hydrocarbons may be used as solvents. Neoprene cements employing a mixture of aromatic and non-aromatic solvents can also be formulated.

Heretofore, cement manufacturers have generally used aromatic hydrocarbons such as toluene, or blends containing a large proportion of these aromatic hydrocarbons, as the solvent in the manufacture of neoprene cements. Although these types of solvents make satisfactory cements they have several disadvantages such as toxicity, relatively high cost and limitation of control of evaporation rate.

ADVANTAGES OF NON-AROMATIC SOLVENTS

Non-aromatic solvents for neoprene have the following advantages over those based on aromatic hydrocarbons.

1. Greater control of solvent evaporation rate.
2. Lower cost.
3. Elimination of toxicity of aromatic hydrocarbons.
4. Less processing labor (in many cases it is unnecessary to masticate the neoprene before dissolving).
5. Low coefficient of penetration into porous surfaces such as fabric and leather.
6. Better storage stability of cements with respect to decrease in viscosity.

The greatest apparent disadvantage is that the viscosity per unit solids content is lower than that obtained when using straight aromatic hydrocarbons, and somewhat more neoprene may be required to obtain the desired viscosity.

TWO-COMPONENT SOLVENT BLENDS FOR NEOPRENE

Blend Component A	Blend Component B	Minimum to Maximum Range of Component A to Give Smooth Solution % by Volume
Acetone	Cyclohexane	30 - 60
Acetone	Hexane	30 - 60
Acetone	Heptane	30 - 60
Acetone	65 Octane Gasoline	20 - 60
Acetone	Kerosene	30 - 60
Methyl Ethyl Ketone	Hexane	30 - 100
Methyl Isobutyl Ketone	Hexane	30 - 100
Methyl Acetate	Hexane	30 - 60
Ethyl Acetate	High Test Gasoline	40 - 80
Benzene	High Test Gasoline	40 - 100
Toluene	High Test Gasoline	40 - 100

SELECTION OF SOLVENT

By selecting the various solvent components, cements differing in physical characteristics may be obtained. For example, a Neoprene GR-M cement made in a blend of methyl acetate, 30 volumes and high test gasoline, 70 volumes, contains methyl acetate as the more rapid evaporating component. Films of this cement lose their methyl acetate first, leaving a film of neoprene, and gasoline in which neoprene is not soluble. Because neoprene is not soluble in the residual liquid and comparatively little of the gasoline is absorbed by the neoprene, the total liquid evaporates rapidly and very high initial bond strength is obtained. This cement has the disadvantage, however, that due to the rapid loss of methyl acetate and consequent speedy transfer of the blend from a solvent to a non-solvent, the applied film is apt to be rough and lumps of neoprene may collect in the brush. As a result, this type of cement may not always be practicable.

If methyl ethyl ketone is substituted for methyl acetate in the above cement, the gasoline non-solvent portion becomes the lower boiling component and evaporates at a faster rate than does the methyl ethyl ketone. This being the case, the ratio of methyl ethyl ketone to gasoline becomes greater as the applied film loses solvent. Inasmuch as Neoprene GR-M is soluble in blends of methyl ethyl ketone and gasoline containing from 30% to 100% (by volume) of methyl ethyl ketone, the residual blend at all times is a neoprene solvent, and consequently, the cement will spread smoothly and will not exhibit any appreciable stringiness.

For further information on non-aromatic solvents for neoprene, write for our technical report BL-207.

DU PONT
BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

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Tech

TECHNOLOGY DEPT!

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- ★ ***Dependable uniformity of crude material***
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- ★ ***Higher pigment loadings***
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- ★ ***Can be blended with GR-S, GEON, and other synthetic rubbers and resins***
- ★ ***Proved dependable performance in severest service***

Our Technical Service Staff is at your service, ready to help with your individual problems. For more information please write Department HD-4, B. F. Goodrich Chemical Company, Rose Building, Cleveland 15, Ohio.

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AN enterprising mid-Westerner had heard about GEON raw materials and the many things that could be made from them. So, he asked himself, why not fly swatters? Products made from GEON, he knew, resist oils and chemicals, sunlight, aging, repeated impact, abrasion, and many other normally destructive factors. They keep their shape indefinitely. They can be brilliantly or delicately colored. They can be waterproof and, so, easily washed. And GEON can be compression molded or injection molded, extruded, calendered or cast into sheet and film.

Samples were made and tested. The initial order was for 300,000 swatters, called Odor-Swat, the King of Swats, made from GEON. These swatters are going to make a good many impressions—on unsuspecting flies—this summer and for years to come.

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Geon
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Textile coatings for rainwear, awnings, industrial aprons.
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Extruded wire and cable insulation.

Photo courtesy The Odor-Swat Co., Brecksville, Ohio

B. F. Goodrich Chemical Company A DIVISION OF THE B. F. GOODRICH COMPANY

For technical data please write Dept. RB-4

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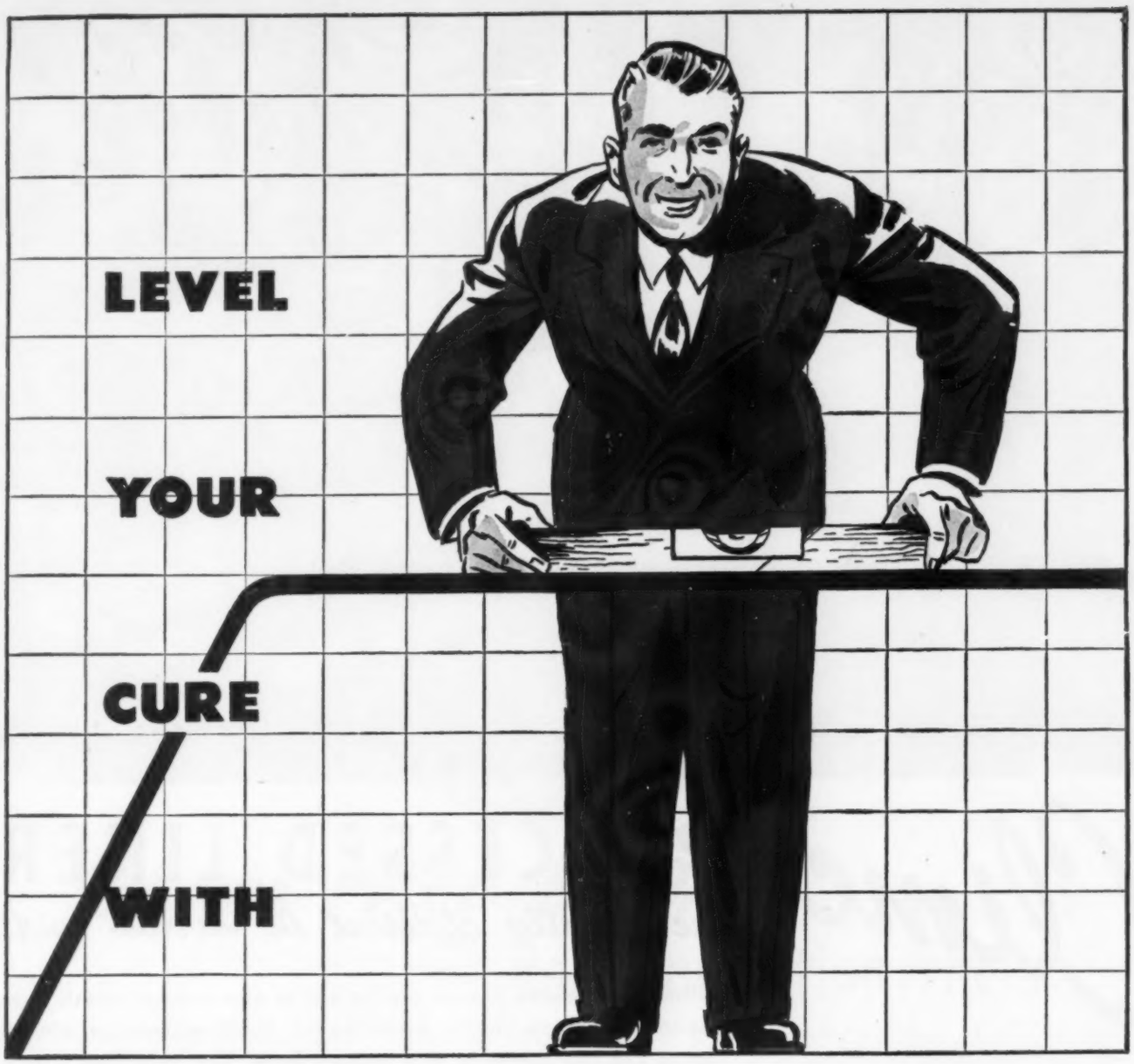

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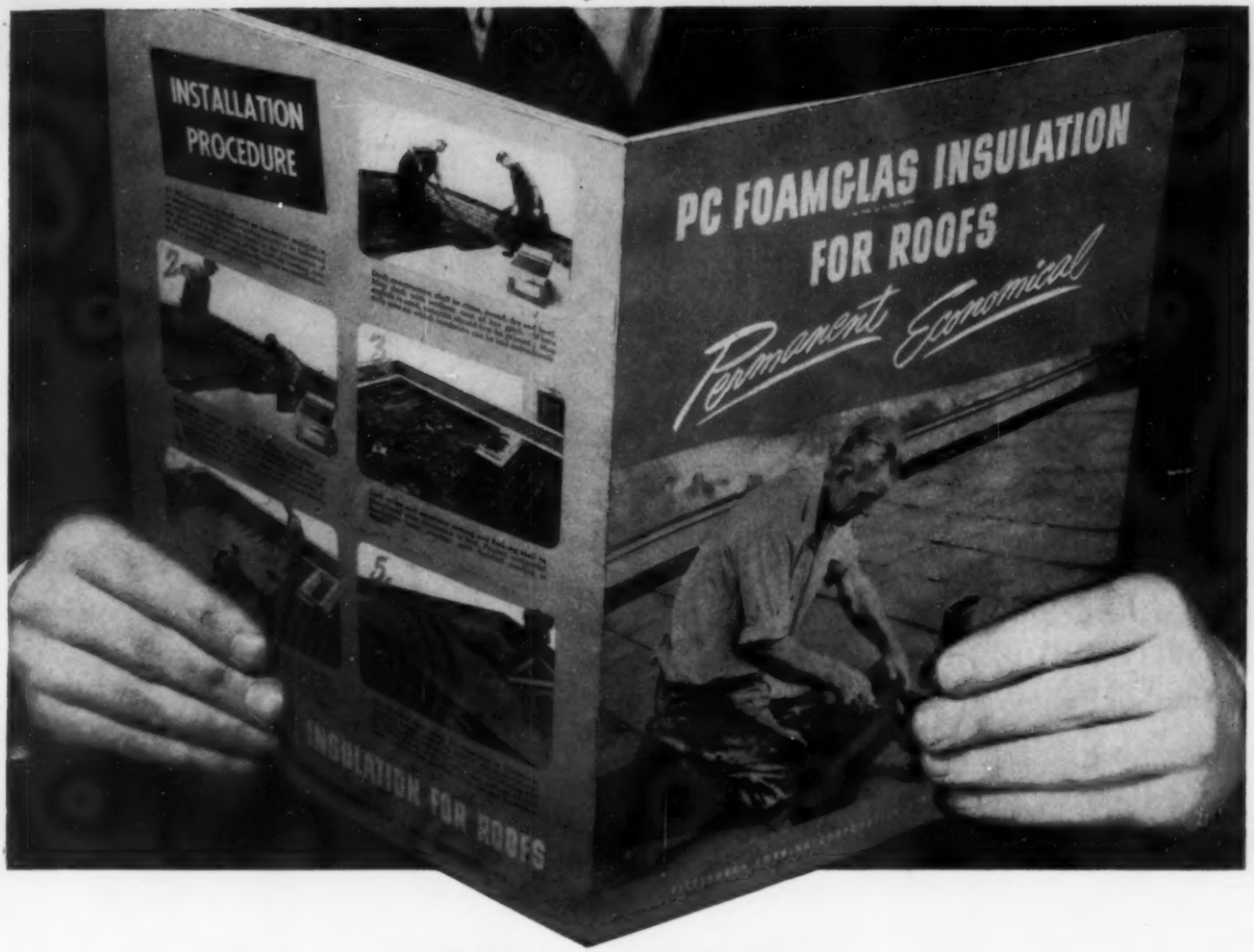

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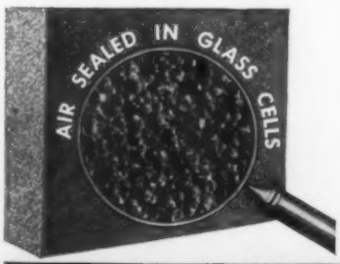

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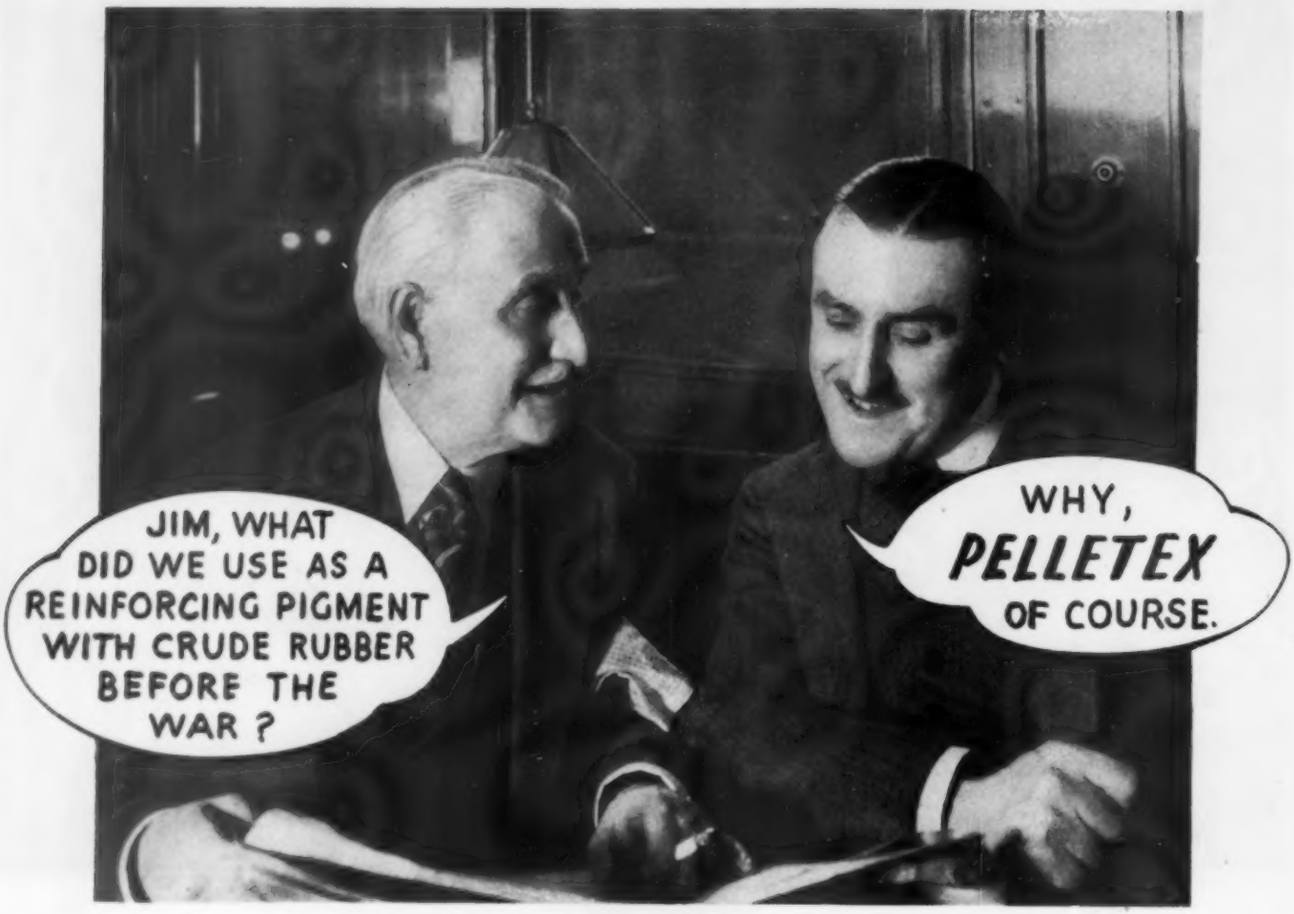

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United research facilities and extensive laboratories, fully staffed with trained personnel, have these standing assignments:

1. To control the carbon black production to specifications and uniformity.

2. To help solve problems connected with the use of carbon black.

3. To anticipate the needs and demands of industry for improved types of carbon black.

Let United's research organization work with you on your carbon black problems. Prompt service and the utmost cooperation rendered. Your inquiries will receive immediate attention.

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• • •

Choice of the proper plasticizer is of the utmost importance in a raincoat such as the one shown here made of transparent unsupported vinyl copolymer film. The plasticizer used in this raincoat must have permanence, excellent stability under all conditions of use, freedom from odor and good low temperature properties.

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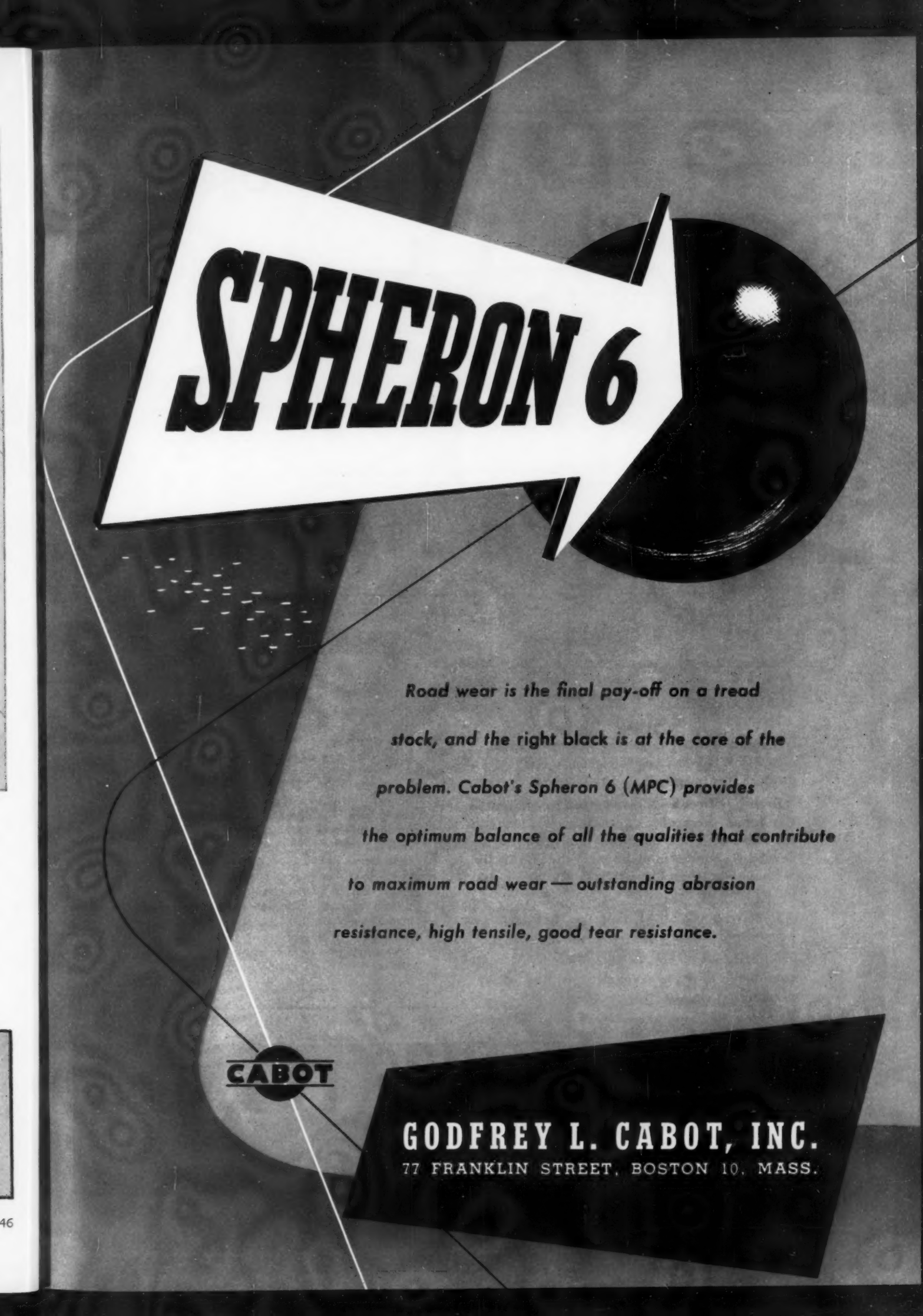
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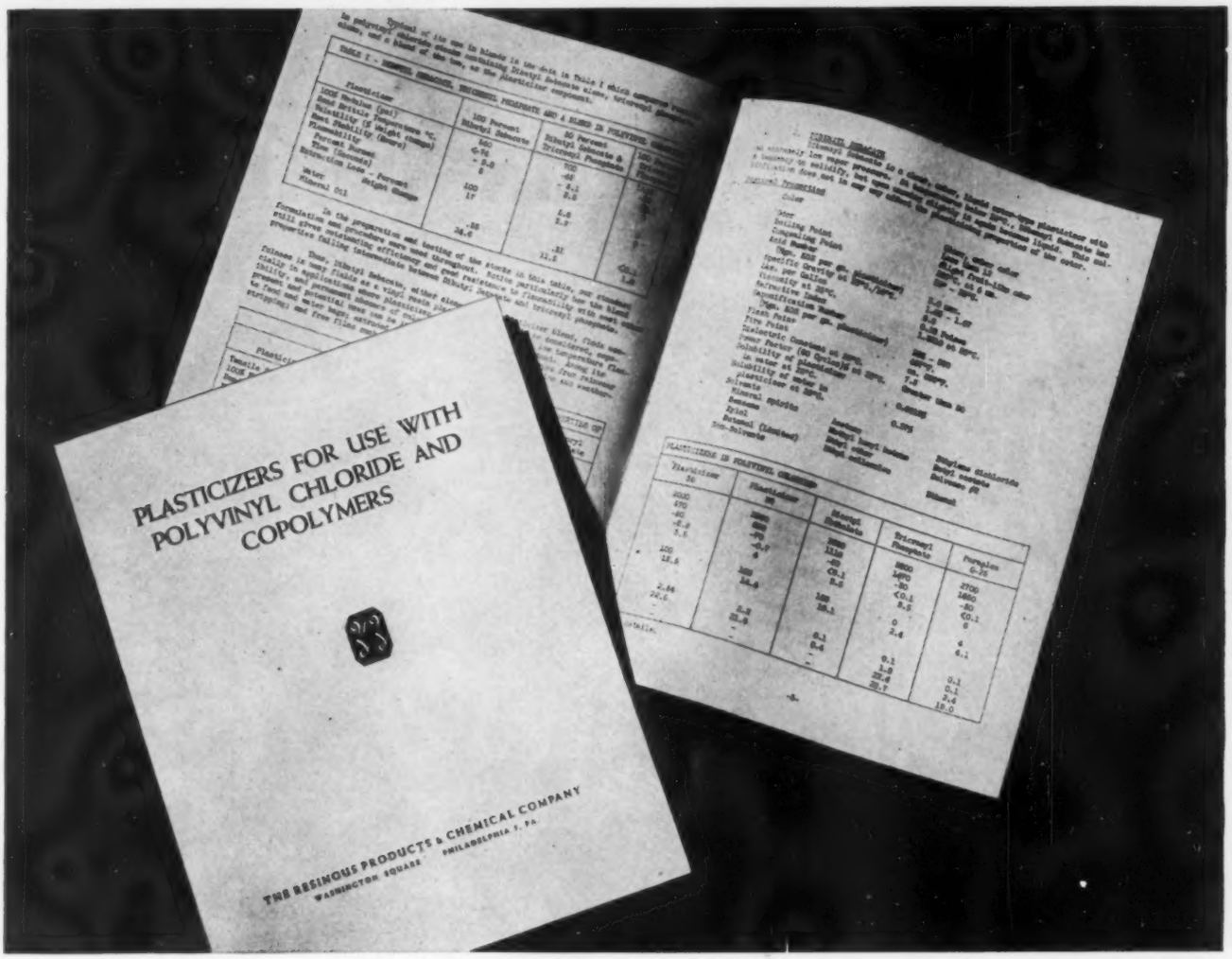
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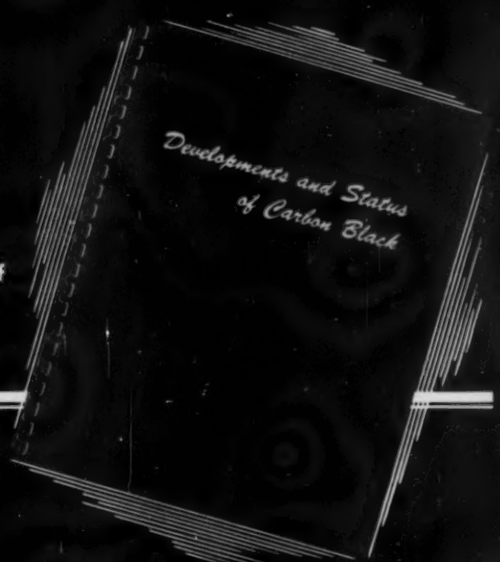

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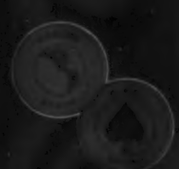

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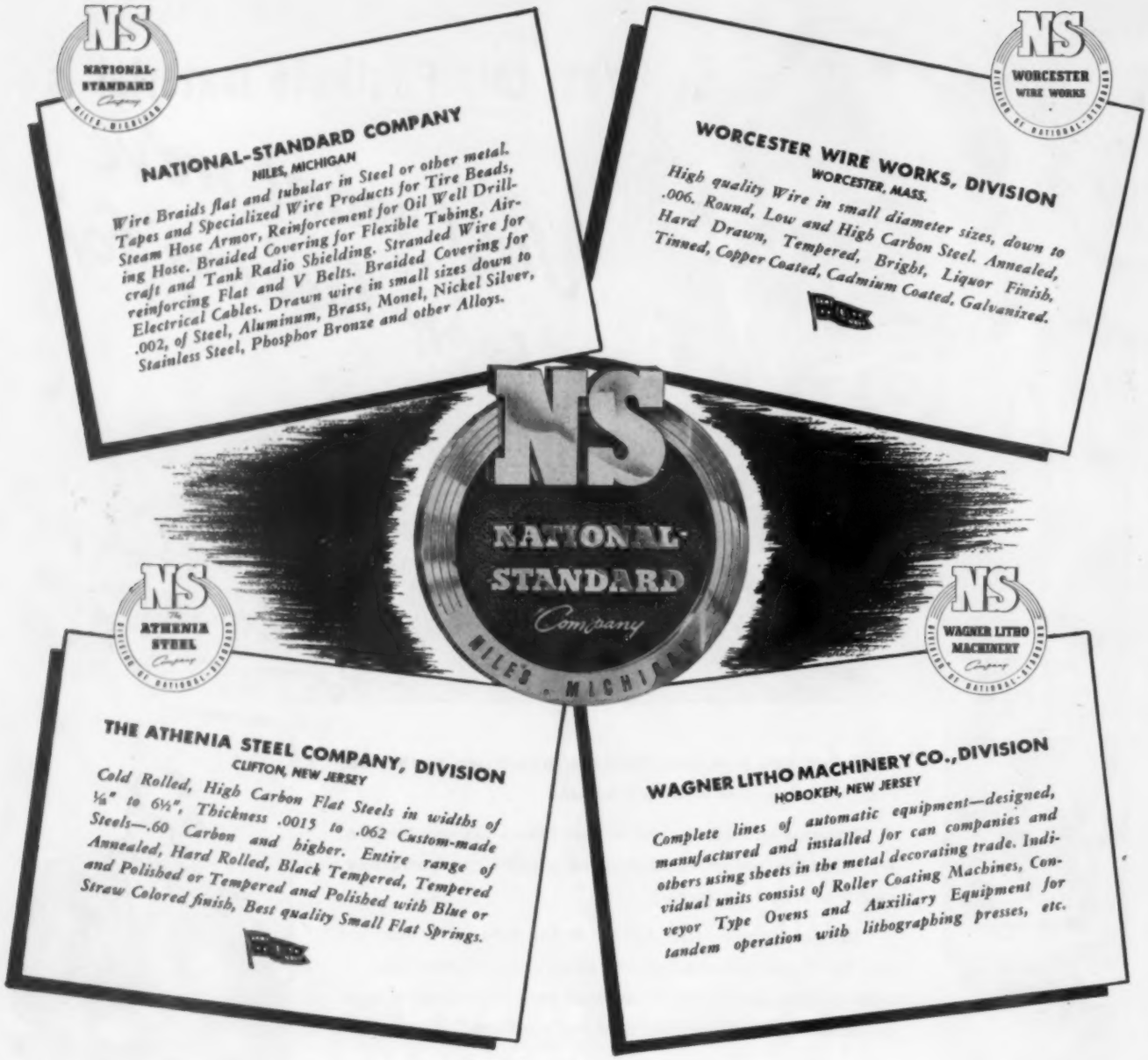
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Cold Rolled, High Carbon Flat Steels in widths of ⅛" to 6½", Thickness .0015 to .062 Custom-made Steels—.60 Carbon and higher. Entire range of Annealed, Hard Rolled, Black Tempered, Tempered and Polished or Tempered and Polished with Blue or Straw Colored finish, Best quality Small Flat Springs.
NS
WAGNER LITHO MACHINERY Company
WAGNER LITHO MACHINERY CO., DIVISION
HOBOKEN, NEW JERSEY
Complete lines of automatic equipment—designed, manufactured and installed for can companies and others using sheets in the metal decorating trade. Individual units consist of Roller Coating Machines, Conveyor Type Ovens and Auxiliary Equipment for tandem operation with lithographing presses, etc.

What Makes These Four Divisions Alike?

Is it merely that they are grouped together under National-Standard's leadership?

No, their kindredness is much more basic.

Each of the four divisions of National-Standard has the unusual faculty for putting itself in its customer's shoes.

Each division likes to tackle tough assignments . . . has long experience in analyzing problems peculiar to many different industries. And, even after a better steel, wire, or any one of the other products listed is developed, work does not stop . . . ways and means of improving a product, its method of use or application are still studied.

Securing better results for the customers of each National-Standard Division is what really makes them alike.

These unique services have won a host of friends . . . we would like to add your Company to this growing list of satisfied customers.

"Pin-Up" for '46

HERE'S an appealing vision for millions of motorists. . . White side-wall tires with red tubes—hmm-m, a gorgeous set-up for any man's money! The real thing can soon replace the vision. Red tubes of Butyl rubber are here now, thanks to SILENE EF. . . Next is the white side-wall tire. . . And that, too, is a probable "come-back" in 1946. It also will be made possible by SILENE EF. . . This fine white reinforcing pigment is assuring greater success in color compounding. It is essential in many non-black compounds to give them needed processing qualities, and the good cured physical properties unobtainable when clays or whitings are used alone as the loading pigment.

SILENE EF

STANDARD Chemical Company

General Offices: AKRON 8, OHIO

New England: 335 Chamber of Commerce Bldg., Boston, Mass.
Mid-Atlantic: Broad Street Bank Bldg., Trenton, N. J.
Mid-West: 2724 W. Lawrence Ave., Chicago, Ill.

TO RELEASE MOLDED RUBBER ECONOMICALLY

USE COLITE CONCENTRATE . . . *A High Quality Concentrated Liquid Mold and Mandrel Lubricant*

- Results in a shiny, satin-like finish.
- Never builds up on the molds.
- Is extremely *economical.*
- Is non-toxic, non-tacky, odorless.

Write today for further information on the Colite Concentrate way of removing cured rubber and plastics from molds

For brighter white goods, Colite D43D is recommended.

THE BEACON COMPANY
PURITY · UNIFORMITY · DEPENDABILITY
Chemical Manufacturers
97 BICKFORD STREET · BOSTON, MASSACHUSETTS

In Canada: PRESCOTT & CO., REG'D., 774 ST. PAUL ST., W. MONTREAL

NEVILLE

Nevillac OA Plasticizer

Specifications and Properties

Sp. Gr. @ 30°/15.6°C.	0.980 to 1.00
Viscosity (Gardner-Holdt)	W (average) @ 25°C
Distillation by volume	Essentially between 300°C and 375°C
Max. % off @ 300°C.	5%
Refractive Index @ 20°C.	1.5355
Molecular Weight	230
Odor	Sweet, Characteristic
Color	Amber
Color Retention	Good

Fields of Use

Adhesives of the waterproof, optical, shoe, packaging and pressure sensitive types;

Paper coatings both waterproof and greaseproof and for ordnance wrap;

Paints and varnishes including laminating varnishes, printing and duplicating inks;

Artificial leather and leather finishes;

Raincoats;

As a plasticizer for ethyl cellulose in lacquers, plastics and stripping compounds.

THIS new plasticizer is an alkylated phenol and has a wide range of solubilities and compatibilities. It is soluble in almost all liquids except water and glycerol. It is compatible with most synthetic resins including cellulose esters and ethers (nitrocellulose, ethylcellulose, cellulose acetate, etc.), vinyl acetate, vinyl butyral, zein, nylon, and partly compatible with vinyl acetate and chloride copolymer.

Being an alkylated phenol, Nevillac OA undergoes typical reactions. For instance, with formaldehyde, oil-soluble phenolic resins are produced which can be formulated as such in varnishes, or can be used in fortifying rosin, rosin esters, alkyd resins and established types of phenolic resins.

Write for gratis sample and further information on Nevillac OA for your particular application.

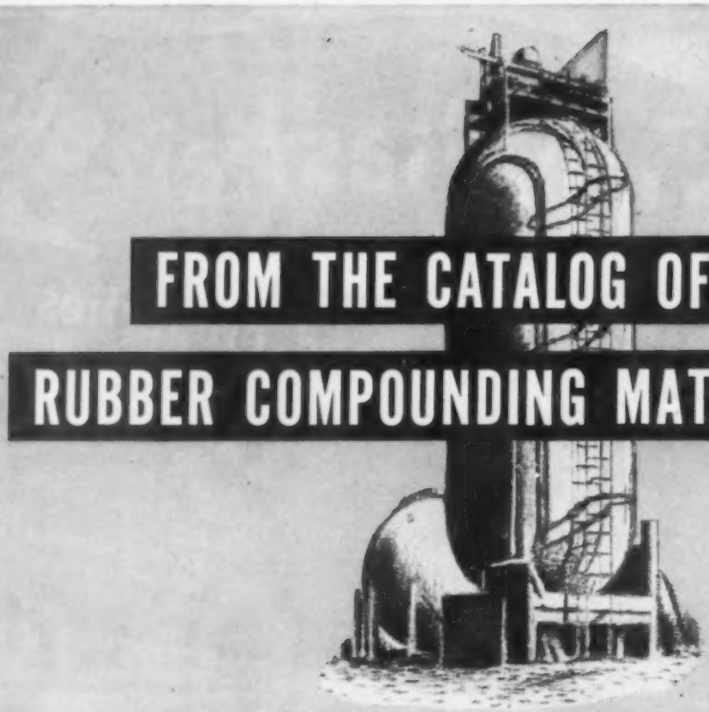
THE NEVILLE COMPANY

PITTSBURGH, 25, PA.

Chemicals for the Nation's Vital Industries

BENZOL · TOLUOL · XYLOL · TOLLAC · NEVSOL · CRUDE COAL TAR SOLVENTS
HI-FLASH SOLVENTS · COUMARONE INDENE RESINS · PHENOTHIAZINE · TAR PAINTS
RUBBER COMPOUNDING MATERIALS · WIRE ENAMEL THINNERS · DIBUTYL PHTHALATE
RECLAIMING, PLASTICIZING, NEUTRAL, CREOSOTE, AND SHINGLE STAIN OILS

A-21



FROM THE CATALOG OF BARRETT

RUBBER COMPOUNDING MATERIALS...

DIBUTYL PHTHALATE

A clear, high boiling water-white liquid used widely as a modifying agent and plasticizer with natural and synthetic resins as well as with certain synthetic elastomers.

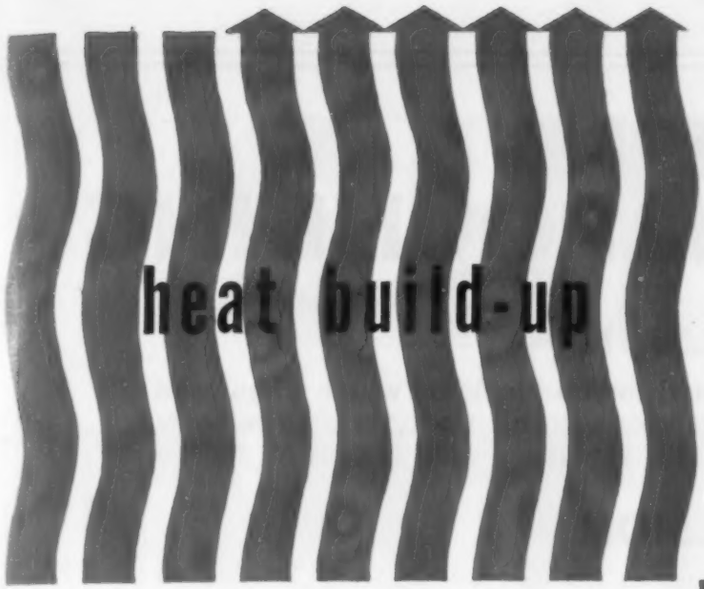
Specific Gravity: 1.047 to 1.049 at 20°C/20°C
Ester Value, 4 Hour Heating Period on the Steam Bath: 99% by weight minimum
Acidity, Free Acid as Phthalic Acid 0.01% by weight maximum
Color: Water white
Odor: Substantially none
Water Miscible without turbidity with 19 volumes of 60° A.P.I. gasoline at 22°C
Appearance: Clear and free of suspended matter
Availability: Tank cars, 50-55 gallon non-returnable steel barrels and small containers.

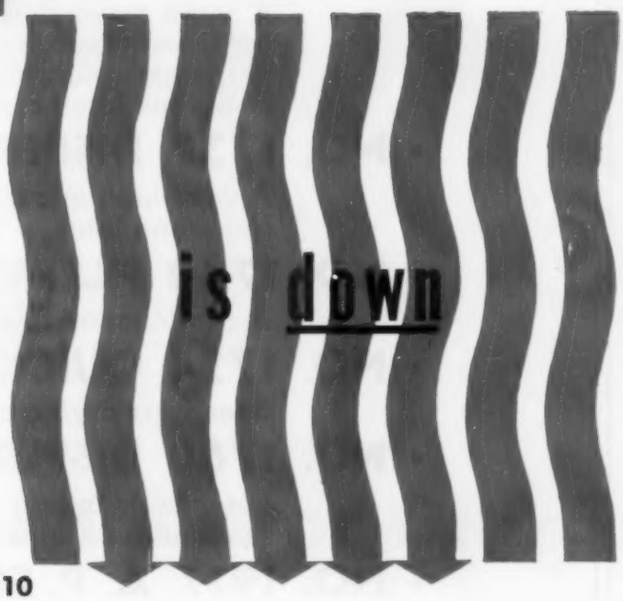
Barrett

THE BARRETT DIVISION
ALLIED CHEMICAL & DYE CORPORATION

40 RECTOR STREET, NEW YORK 6, N. Y.

In Canada: The Barrett Company, Ltd., 8551 St. Hubert Street, Montreal, Que.





...when you use Monsanto's Lampblack No. 10

In all rubbers, especially natural rubbers, Monsanto Lampblack No. 10 has demonstrated a definite superiority in smoothness—with consequent less friction, *less heat build-up.*

In addition this precision-made black offers a maximum degree of purity and carbon content and an excellent blue-gray undertone.

It will pay you to investigate Monsanto's Lampblack for rubber now. Trial samples, full technical data and consulting service are yours for the asking: MONSANTO CHEMICAL COMPANY, Merrimac Division, 30 Rockefeller Plaza, New York 20, N. Y.

MONSANTO CHEMICALS

SERVING INDUSTRY...WHICH SERVES MANKIND

FOR
LATEX COMPOUNDING

- **NO. 1954 EMULSION**

  A combination emulsion and tackifier which when used with Latex (synthetic or natural) produces latex cements with excellent tack retention and improved tensile strength.

- **NO. 1956 EMULSION**

  A three way emulsion for Neoprene latex. Acts as an acid acceptor in addition to being a tackifier and Neoprene extender. An exceptional compounding base for Neoprene latex cements.

- **NO. 1737 DISPERSION**

  A combination curing dispersion and acid acceptor for Neoprene latex.

- **NO. 1740 FILLER DISPERSION**

  A combination filler and stabilizer for all types of latex.

- **NO. 1754 QUICK DRYING DISPERSION**

  Speeds up drying of latex compounds.

- **NO. 1760 DISPERSION**

  For compounding latex to adhere to non-porous surfaces such as plastic.

- **NO. 1917 A. P. FOAM REDUCER**

  Prevents latex compounds from foaming when used in machines.

• WE ALSO MANUFACTURE OVER 400 TYPES OF RUBBER CEMENT AND LATEX CEMENT —SUITABLE FOR ADHESING—

• Plastic	• Rubber	• Metal	• Tinfoil
• Leather	• Fabric	• Cork	• Sponge Rubber
• Wood	• Glass	• Leatherette	• Paper

ADHESIVE PRODUCTS

NEW YORK RUBBER DIVISION
(ESTABLISHED 1895)

CORPORATION

1660 BOONE AVENUE
BRONX 60, NEW YORK

SHELL DUTREX 6

Plasticizer and Extender for GR—S

Chemically and physically Controlled

Direct inquiries to:

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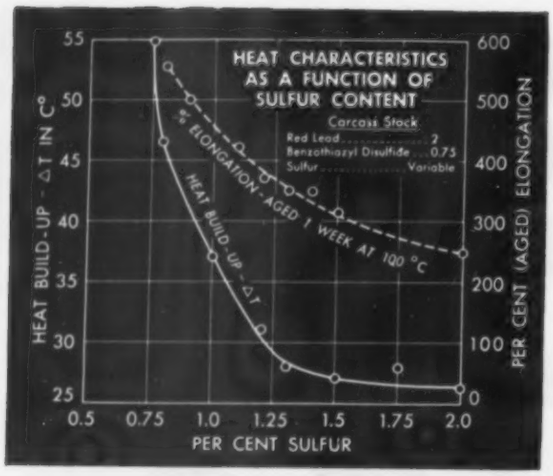
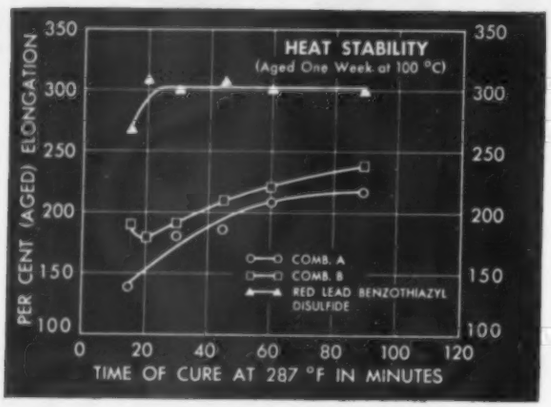
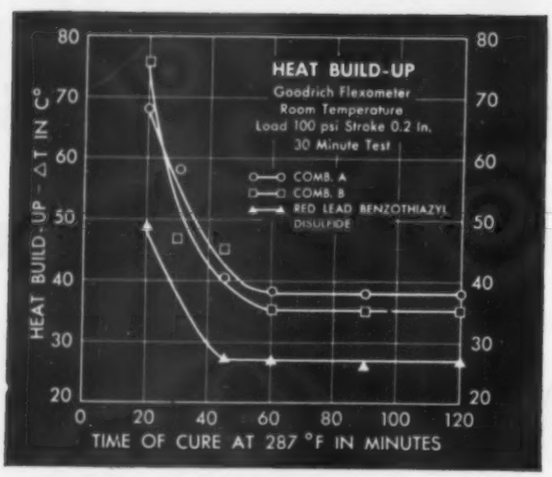
50 WEST 50th ST., NEW YORK 20, N. Y.
(East of Rockies Territory)

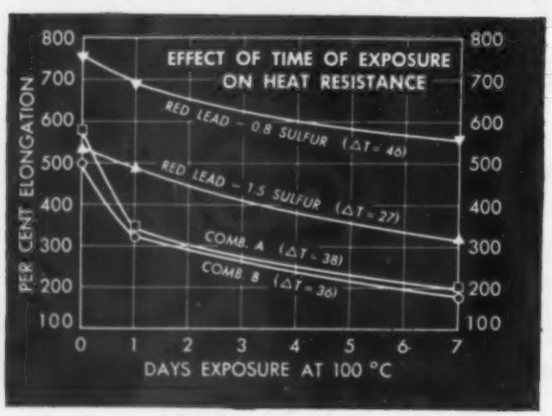
100 BUSH ST., SAN FRANCISCO 6, CALIF.
(Pacific Coast Territory and Western Canada)

SHELL OIL COMPANY OF CANADA, LTD., 25 ADELAIDE ST., EAST TORONTO, CANADA
(Eastern Canada)


HEAT CHARACTERISTICS AS A FUNCTION OF SULFUR CONTENT
Carcass Stock
Red Lead 2
Benzothiazyl Disulfide ... 0.75
Sulfur ..... Variable
% ELONGATION - AGED 1 WEEK AT 100 °C
HEAT BUILD-UP - ΔT
HEAT BUILD-UP - ΔT IN C°
PER CENT (AGED) ELONGATION
PER CENT SULFUR


HEAT STABILITY
(Aged One Week at 100 °C)
COMB. A
COMB. B
RED LEAD BENZOTHIAZYL DISULFIDE
PER CENT (AGED) ELONGATION
TIME OF CURE AT 287 °F IN MINUTES




EFFECT OF TIME OF EXPOSURE ON HEAT RESISTANCE
RED LEAD - 0.8 SULFUR (ΔT = 46)
RED LEAD - 1.5 SULFUR (ΔT = 27)
COMB. A (ΔT = 38)
COMB. B (ΔT = 36)
PER CENT ELONGATION
DAYS EXPOSURE AT 100 °C

Heat build-up and heat stability . . . both improve when you compound GR-S with RED LEAD

Have you had difficulty making your GR-S carcass stocks both heat resistant and cool running?

If so, try the right combination of red lead, benzothiazyl disulfide and sulfur.

Its acceleration is sufficiently active and efficient to provide—concurrently—heat stability and low heat build-up.

Note the following table and the accompanying charts.

FORMULA

GR-S (Institute)	100
S.R.F. Black	30
Zinc Oxide	3.0
Paraflux	7.5
No. 2 R.M. Red Lead	2.0
Benzothiazyl Disulfide	0.75
Sulfur	1.5

Physical Properties

T/287° F.	Tensile Strength	% Elong.	T-300	Shore	ΔT° in C°
15	1520	860	315	....	....
20	1630	780	390	46	49
30	1450	630	520	47	47
45	1330	530	570	47	27.5
60	1210	480	520	47	27
90	1130	500	590	47	26
120	1100	500	610	47	28

	Aged One Week at 100° C.			Aged 48 Hours at 100° C.	
T/287° F.	Tensile Strength	% Elong.	T-300	Shore	ΔT° in C°
15	910	270	.....	....	....
20	1080	320	1000	54	30.5
30	990	300	990	54	30.5
45	1050	310	1000	53	29.5
60	1130	300	1090	53	26
90	1090	300	1090	53	25
120	1160	340	1100	53	25

** Goodrich Flexometer operated at room temperature. 30 minute tests. Load 100 psi, stroke 20%.*

SUMMARY OF ADVANTAGES

1. Imparts improved heat resistance—retention of elasticity.
2. Imparts improved heat build-up—cooler running.
3. Relatively faster curing rate.
4. Safe processing.
5. Excellent general physical properties.
6. Broad curing plateau—very little change in properties on overcures.
7. Economical.
8. Available.

The charts illustrated are taken from a report on recent experimental work by the Rubber Division of our Research Laboratories on the problem of heat build-up and heat stability in GR-S stocks. Write for your copy. The report is titled, "The Heat Problem in GR-S Carcass Stocks."

NATIONAL LEAD COMPANY New York, Buffalo, Chicago, Cincinnati, Cleveland, St. Louis, San Francisco; Boston (National-Boston Lead Co.); Pittsburgh (National Lead & Oil Co. of Penna.); Philadelphia (John T. Lewis & Bros. Co.)

The C. P. Hall Co.
CHEMICAL MANUFACTURERS

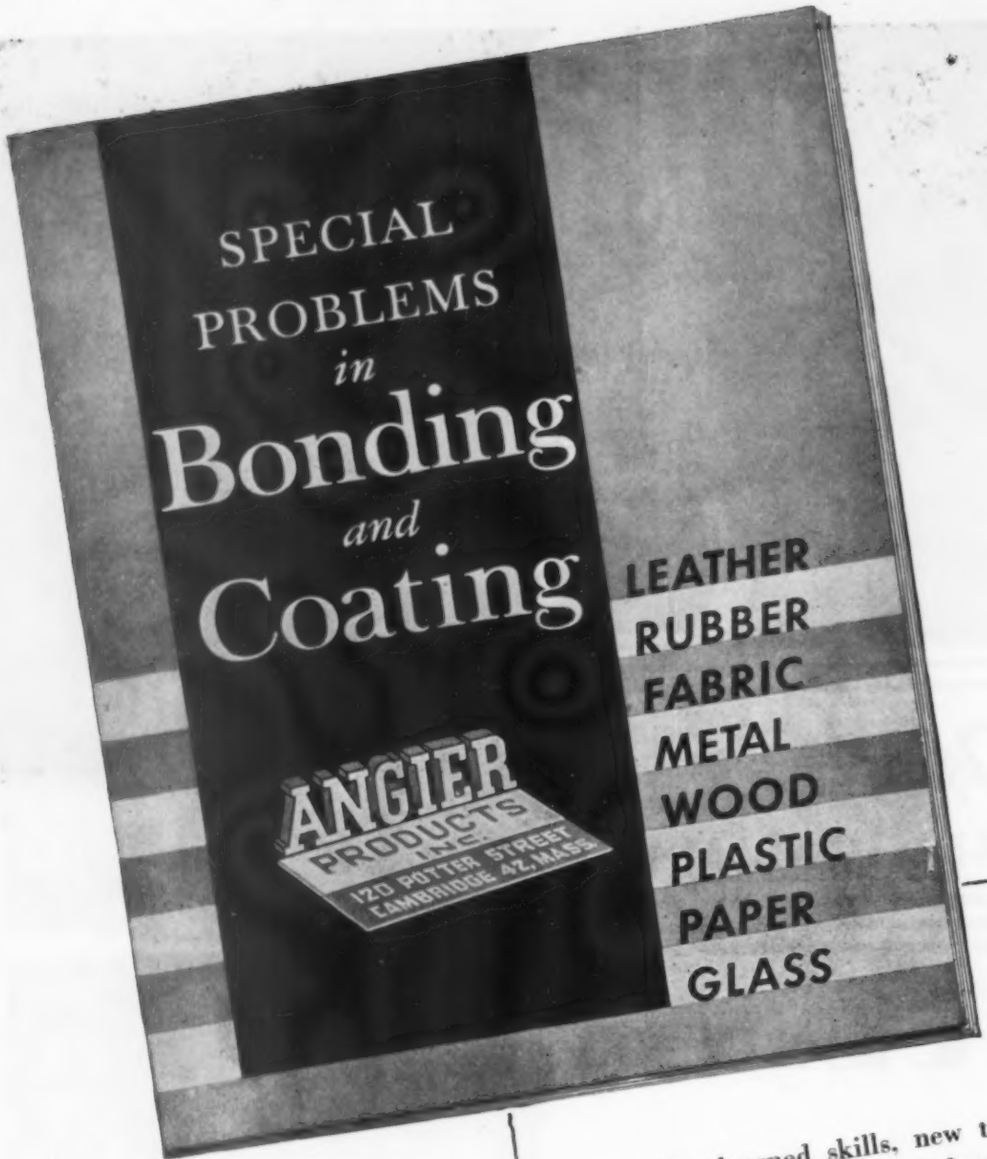
ACCELERATORS

PLASTICIZERS

ANTIOXIDANTS

A Complete Line of Approved Compounding Materials

AKRON, OHIO • LOS ANGELES, CALIF. • CHICAGO, ILL.



War-learned skills, new techniques and the multiplication of uses for adhesives, cements, coatings and laminants are the theme of this illustrated brochure. It will suggest to you how the long experience and the laboratory and manufacturing facilities of Angier Products, Inc. can be put to work for you in solving today's pressing production problems. A request on your letterhead will bring a copy of this brochure to your desk.

ANGIER
PRODUCTS
INC.
120 POTTER STREET
CAMBRIDGE 42, MASS.

GOOD PROCESSING IN YOUR PLANT STARTS IN OUR LABORATORY

Catch more eyes... *AND YOU'LL CATCH MORE CUSTOMERS*

Hands reach, only after eyes reach, for your product in today's mass displays. Get an eye-catching plus with whiter, brighter Coated Lithwite cartons

WHAT IS IT that draws more shoppers' eyes to *Coated* Lithwite cartons... in modern, mass counter and shelf displays? *Coated* Lithwite is whiter, brighter. The smooth, velvety... chalk-free surface of this revolutionary new paper-board is a perfect base for printing inks... brings colors up sharply... reproduces pictures with compelling, life-like realism.

Proved and improved for 7 years. *Coated* Lithwite is the sensational paper-board that is formed, made and coated in one high-speed operation. Used, to-day, to package many of America's most famous products.

Smoother packaging production. Fewer "jammers" and "leakers" with *Coated* Lithwite cartons. Accurate folding without shattering or flaking. And *Coated* Lithwite takes a tight, positive seal. While production is currently sold up, now is a good time to discuss future carton needs with your Gardner-Richardson representative.

More eyes reach for your product in

Coated Lithwite Cartons

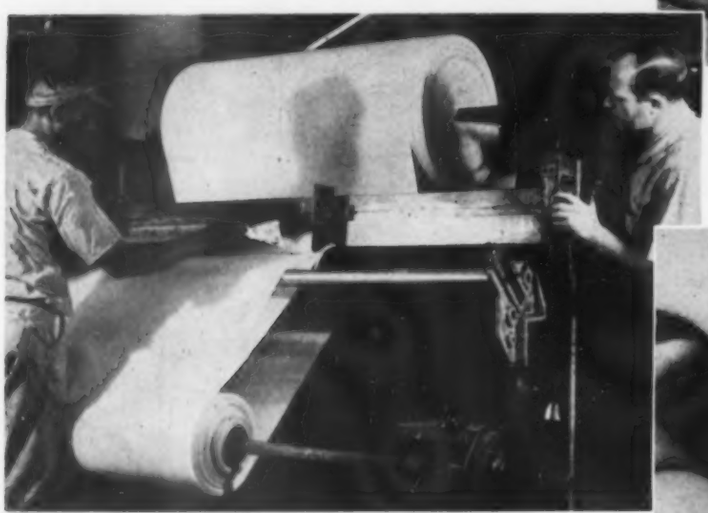
The GARDNER-RICHARDSON Co. • Manufacturers of Folding Cartons and Boxboard • Middletown, Ohio

Sales Representatives in Principal Cities: PHILADELPHIA • CLEVELAND • CHICAGO • ST. LOUIS • NEW YORK • BOSTON • PITTSBURGH • DETROIT

ONE SHOT COMBINING

Bone Dry Lamination . . .
Maximum Speed of Production . . .

Application of UBS compounded GR-S Latex Combining Cement to fabric at coating knife. Note heavy viscosity and body, enabling efficient handling and application.



Wet Combining in process in same Can Drier operation. Note rolling bank of UBS Combining Cement at knife and high solids film deposit of sufficient depth to enable wet stick.

UBS compounded GR-S Latex Combining Cement provides a positive, *one coat* bond, good flexibility, and excellent moisture resistant and ageing qualities.

Phone, wire or write for further information.

Address all inquiries to the Union Bay State Chemical Company, 50 Harvard St., Cambridge 42, Mass.

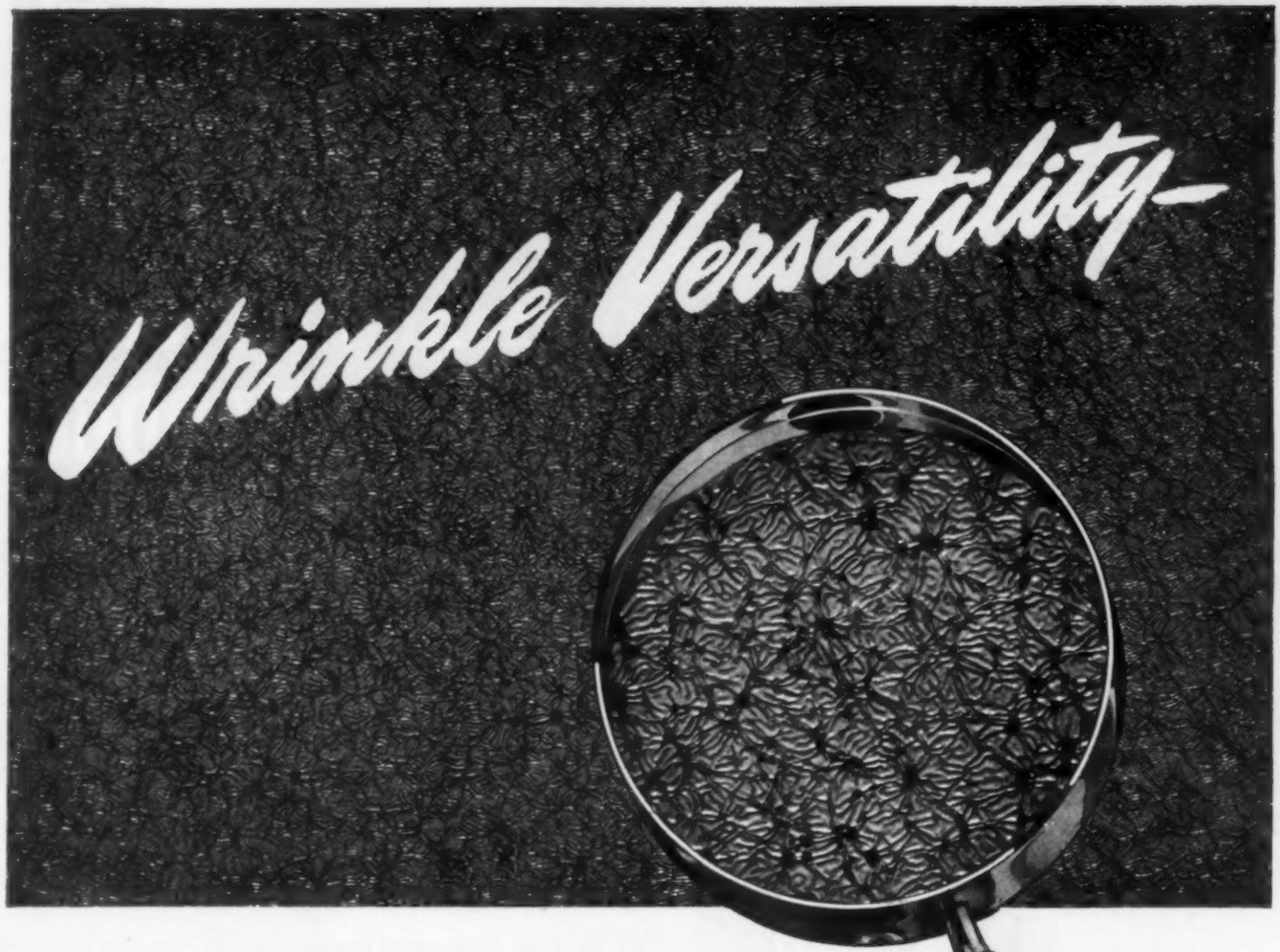
UBS

UNION BAY STATE
Chemical Company

Serving Industry with Creative Chemistry

ORGANIC CHEMICALS · SYNTHETIC LATEX · SYNTHETIC RUBBER
PLASTICS · INDUSTRIAL ADHESIVES · DISPERSIONS
COATING COMPOUNDS · IMPREGNATING MATERIALS · COMBINING CEMENTS

Wrinkle Versatility—



means combinations of colors, too!

Wrinkle coatings are available in any colors you want—in primary colors, tints, pastels and *combination* effects for unusual eye appeal. Wrinkle versatility doesn't stop there. Users find, for example, that Wrinkle is used on *flexible* materials with the same success as on metal or similar surfaces.

Wrinkle is economical to use, requiring only one top coat. It covers imperfections in castings and weldments without extensive clean-up necessary with smooth finishes. Wrinkle protects while it enhances the beauty of coated surfaces. It doesn't chip or peel and is extremely durable even under adverse conditions.

Approximately 200 leading paint and varnish plants which manufacture Wrinkle under our license can supply you with Wrinkle coatings in a variety of textures, patterns, and colors to suit your needs.

Write for "New Wrinkles in Finishing," a bi-monthly report on developments in the Wrinkle field.

New Wrinkle, Inc.,

Wrinkle
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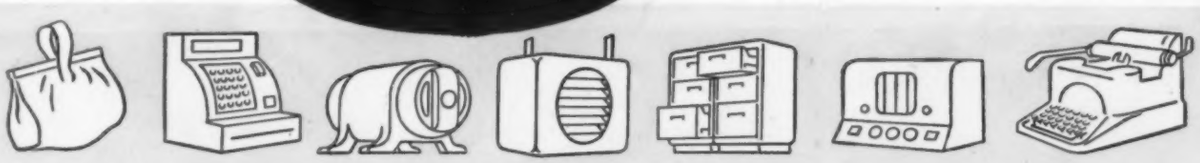
Offices and Research Laboratories
1767 Springfield St., Dayton 3, Ohio



THE "STANDARD ANSWER" TO VARIED FINISHING NEEDS

Peace-time demands for NEOPRENE COMPOUNDED PRODUCTS

give new importance to CALCINED MAGNESIA

made under controlled temperature

IT'S UNIFORM

1. UNIFORM wetting power and ease of dispersion
2. UNIFORM dispersion with improved stabilizing effect
3. UNIFORM quality maintained in moisture-proof packaging

"Give us more Neoprene compounded products." Every day the demand increases as war-time experience with Neoprene becomes known.

The sharp rise in the use of Neoprene for many new products makes it doubly important for Neoprene compounders to know the importance of selecting a uniform Calcined Magnesia.

And one vital factor in the uniformity of Calcined Magnesia is controlled temperature in manufacturing. Baker gives you this plus with specially built electric ovens. This electrically controlled calcining process gives definite uniformity and also eliminates possibility of oxide contamination from products of combustion.

The indexes of chemical purity for Calcined Magnesia are extremely high. The indexes for iron and calcium are extremely low. The processing of neoprene is still a very sensitive operation. That is why you will be interested in the distinctive features of Baker's Calcined Magnesia, shown in the panel.

We urge you to test Baker's Magnesium Oxide (Neoprene grade). Test it for its ease of dispersion—its ease of compounding of stock—its rate of cure — its tensile strength — and its plasticity. Learn why Baker's light Calcined Magnesia is better. Send for free samples.

J.T. Baker Chemical Co., *Executive Offices & Plant:* Phillipsburg, N. J.
***Branch Offices:* New York, Philadelphia, Boston and Chicago.**

Baker's *Light* CALCINED MAGNESIA

(MAGNESIUM OXIDE)

The electron microscope reveals that Witcarb R particles have an average diameter of .030 microns . . . the finest size ever manufactured.

IT'S ALWAYS THE SAME...

Finer, dependably uniform particle size increases tensile strength and resistance to tear and abrasion

WITCARB R and R-12

These precipitated calcium carbonate pigments of small, dependably uniform particle size, have found widespread favor as pigments and extenders for natural and synthetic rubber, with real reinforcing properties, especially in GR-S and other synthetic stocks.

Witcarb R is the finest particle size calcium carbonate pigment ever manufactured and in this respect is nearest to channel black. The average particle diameter, as shown by the electron microscope, is .050 microns. Because of its fine particle size, Witcarb R makes an excellent reinforcing pigment for light colored stocks especially in GR-S and natural rubber, resulting in increased tensile strength and resistance to tear and abrasion with relatively low modulus and high elongation. With GR-S it is possible to use higher loadings of Witcarb R, thereby securing maximum reinforcement with low hardness and modulus. Another advantage not to be overlooked is resulting lowered cost.

Witcarb R-12, having a slightly larger particle size of 0.15 microns, has found favor in rubber manufacture as a filler since it can be used in moderate loadings without affecting the physical properties of high quality rubber compounds, thereby conserving rubber and decreasing costs.

Both Witcarb R and R-12 may be used in combination with carbon blacks. The bulletins listed below are available, giving technical data on which the above conclusions are based.

No. 44-2 Witcarb R—A New Reinforcing Pigment for Rubber and Synthetic Rubber (GR-S);

No. 44-4 Channel Black — Witcarb Mixtures in GR-S;

No. 45-2 Witcarb R in GR-I, Oil Resistant Synthetics and Natural Rubber Reclaim.

Copies will be mailed on request.

WITCO CHEMICAL COMPANY

MANUFACTURERS AND EXPORTERS

295 MADISON AVENUE · NEW YORK 17, N. Y.

Boston · Chicago · Detroit · Cleveland · Akron · London

CONTINENTAL CHANNEL BLACKS

COVERING INDUSTRY'S NEEDS

Continental Carbon's progressive research and development policy provides a complete line of channel blacks for a full range of applications in the rubber industry.

Continental Carbon Company's plant at Sunray, Texas, includes one of the world's largest channel black installations.

CONTINENTAL F, hard processing . . . for long-wearing treads of natural rubber in light and medium weights, mechanical goods, soles, heels and belting.

CONTINENTAL A, medium processing . . . for reinforcing natural and synthetic rubber tire treads, mechanical goods, soles, heels, belting and cable jackets.

CONTINENTAL AA, easy processing . . . for synthetic and natural tire treads, solid tires, GR-S carcass stocks, wire and cable covers.

CONTINENTAL R-20, medium conductivity . . . for use in compounds where the degree of conductivity of R-40 is not needed.

CONTINENTAL R-40, high conducting . . . for rubber compounds used where sparks from static electric charges may be hazardous.

CONTINENTAL CARBON COMPANY
MANUFACTURER

WITCO CHEMICAL COMPANY
DISTRIBUTOR AND EXPORTER

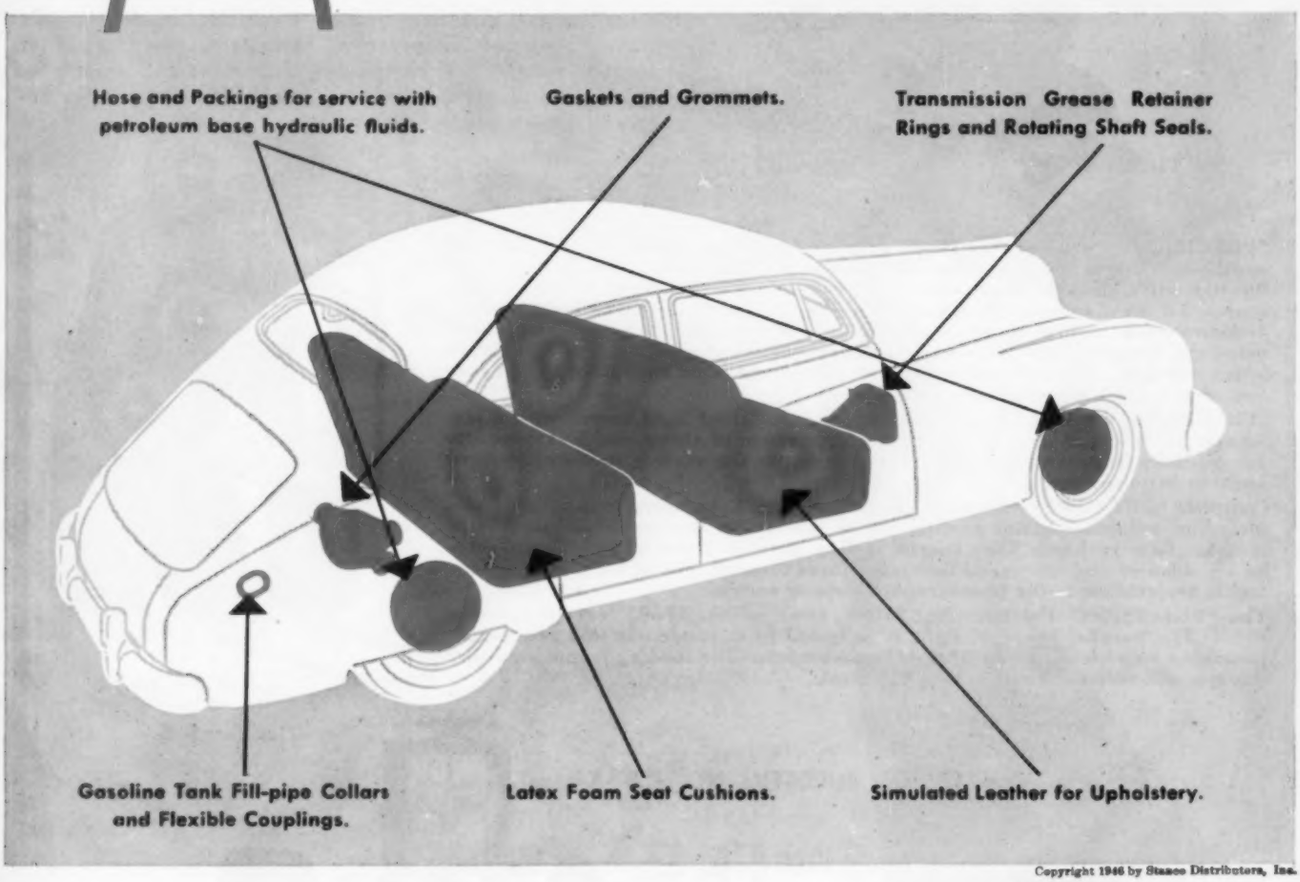
CONTINENTAL CHANNEL AND FURNACE BLACKS

295 MADISON AVENUE, NEW YORK 17, N. Y. • Boston • Chicago • Cleveland • Akron • Detroit • London

"Sure, a good name sells itself—

BUT..."

We're selling more than the name PERBUNAN to the Automotive Industry . . . we're currently calling attention to these specific uses:


Hose and Packings for service with petroleum base hydraulic fluids.
Gaskets and Grommets.
Transmission Grease Retainer Rings and Rotating Shaft Seals.
Gasoline Tank Fill-pipe Collars and Flexible Couplings.
Latex Foam Seat Cushions.
Simulated Leather for Upholstery.

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PERBUNAN merits its GOOD NAME because of its long wearing quality, and its resistance to high temperature fatigue, to low temperature stiffening, to oil, dry cleaning compounds, gasoline and petroleum base hydraulic fluids.

Talk over your compounding problems with the nearest Stanco Distributors Representative. His *confidential* cooperation can help you with the development of new products, improvement of present products and reduction of costs. PERBUNAN WILL SERVE YOU BETTER AND SAVE YOU MONEY.

STANCO DISTRIBUTORS, INC., 26 Broadway, New York 4, N. Y.; First Central Tower, 106 South Main Street, Akron 8, Ohio; 75 East Wacker Drive, Chicago 1, Illinois. West Coast Representatives—H. M. Royal Inc., 4814 Loma Vista Avenue, Los Angeles 11, California. Warehouse stocks in Elizabeth, New Jersey; Los Angeles, California; Chicago, Illinois; and Baton Rouge, Louisiana.

PERBUNAN
REG. U. S. PAT. OFF.

THE SYNTHETIC RUBBER THAT RESISTS OIL, COLD, HEAT AND TIME

No. 13697

New Accurate Fast

PRECISION POLARIZING INSTRUMENTS

FOR OBSERVING STRAINS IN TRANSPARENT PLASTICS AND GLASS!

"Precision" Polarizing instruments were developed to determine the amount of strain produced by fabrication, stress or mechanical manipulation of photo-elastic materials. May also be used in identifying transparent plastics, glass and other similar materials and is invaluable in determining strains produced under stress in construction designs of opaque materials by employing a transparent model for testing and observation. Equally valuable in research laboratory or production control.

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No. 13698

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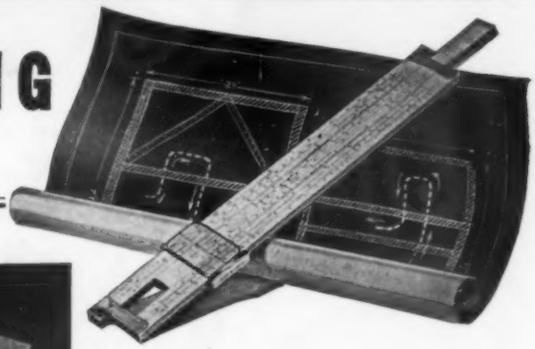
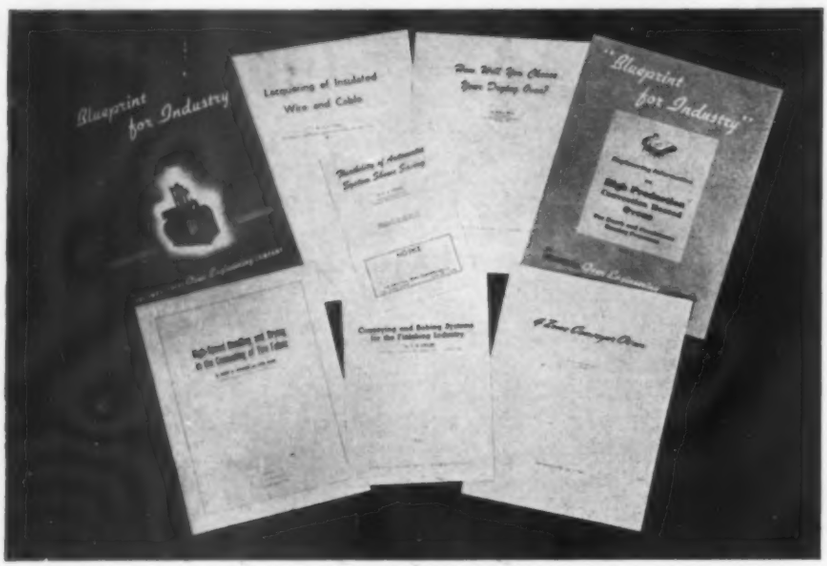
*Reg. U. S. Pat. Off. **Trade-Mark

OVEN ENGINEERING NEWS





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The battle of costs is a battle that never ends. Present day problems dictate the policy of constantly surveying your existing facilities for materials-handling as well as your oven-processing systems, in order to keep your manufacturing costs at a profitable level.

The Industrial Oven Engineering Company designs, engineers, manufactures and installs complete materials-handling and oven-processing systems for many different industries.

These installations are described in the pamphlets listed below. They are well illustrated with photographs and drawings. A good many of these installations are probably applicable with slight variation, to your own processing problems.

These pamphlets are free. They are briefly described below. Check off the ones you want and drop us a line.

☐ **Blueprint for Industry, Part III**—Complete engineering information on our constant-speed, constant-tension windup machine for wire, cable, textile, tape, coated fabrics and other continuous materials, the only machine of its kind on the market.

☐ **Lacquering of Insulated Wire and Cable**—A 16-page reprint of a thorough-going article on cable lacquering techniques and equipment, originally published in the trade magazine "Wire and Wire Products". Illustrated with drawings.

☐ **How Will You Choose Your Drying Oven?**—A description of the role of the infra-red lamp in modern drying ovens.

☐ **Blueprint for Industry, Part II**—A comprehensive 18-page brochure on high-production ovens for many batch and continuous heating processes. In addition to detailed descriptions and engineering details of many efficient oven-materials-handling systems, it contains two pages of engineering data on gases and other materials, along with fan engineering data.

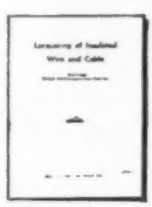
☐ **High-Speed Handling and Drying in the Cementing of Tire Fabric**—A description of a continuous, safe method of fabric cementing in which high-calendering speeds were obtained by the designing of equipment which would fit into limited manufacturing space.

☐ **Flexibility of Automatic Systems Shows Saving**—A description of a 3-zone automatic conveyer oven installation which increased production speed, reduced the number of necessary attendants without loss of floor area.

☐ **Conveying & Baking Systems for the Finishing Industry**—A thorough discussion of the different types of conveyer and baking systems with an analysis of their respective advantages.

☐ **Four-Zone Conveyor Oven**—This reprint describes a four-zone conveyor oven through which products are conveyed successively through ventilation, preheating, baking and cooling zones at production speeds and free from all dust.

Get This Unusual Story of Wire Lacquering



We have in our last four advertisements described several different cable lacquering systems that we have engineered and installed. For those interested in securing a more complete picture of the basic IOE cable lacquering systems there is available, *Lacquering of Insulated Wire and Cable*, a 16-page reprint of a thorough-going article on cable lacquering technique and equipment, originally published in WIRE AND WIRE PRODUCTS. Our work on cable lacquering systems in particular represents *new basic thinking* on an old problem, that has a wide number of new applications. Perhaps some of your own problems would benefit by the application of our engineering experience.

(This is No. 25 of a series. Reprints of previous advertisements sent free upon request.)

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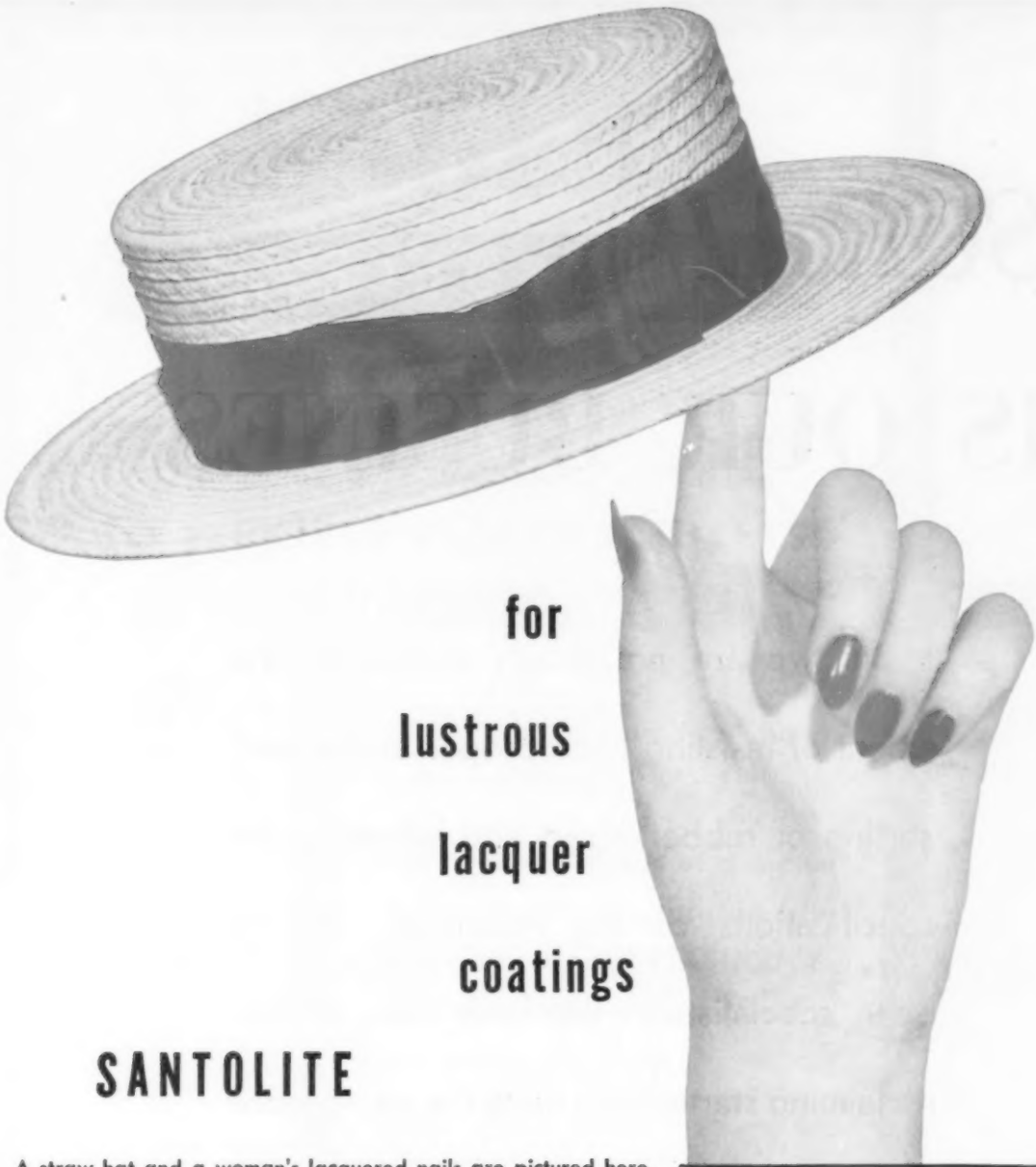

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Retentivity in Cellulose Acetate**	Over 100	Over 100	Over 100
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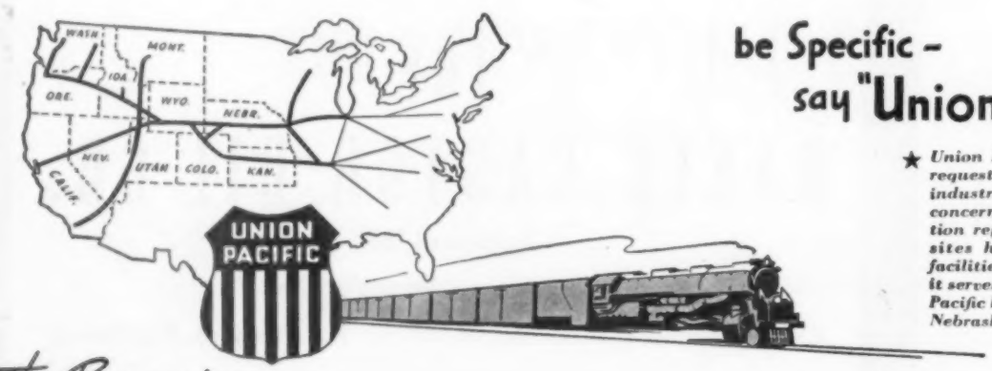

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Rubber

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Sample and technical data sent promptly on request

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Answer: In simplest terms, it's a fabric with a rubber coating.

Question: What goes on inside a tire when it's rolling along the road?

Answer: It flexes—it is subject to severe stresses and strains—AND, its temperature goes up. That's the important thing. Heat is a tire's worst enemy—the most frequent cause of road failures and blowouts. It's important news when science can KEEP TIRES COOLER BY USING RAYON CORD.

Question: How does rayon keep tires cooler?

Answer: First, rayon being stronger, makes a lighter tire that generates less heat; second, while all tires heat up under any running conditions, rayon maintains higher tensile strength as a tire gets hotter, whether the tire is made of natural, synthetic or combination rubbers. Those are the reasons why tire manufacturers and bus and truck fleet owners report greatly increased mileage and reduction in blowouts with rayon cords.

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Answer: Industrial has made many important contributions to the production of rayon for tires. Industrial's Tyron yarn, cord and fabric—products of unequalled uniformity and excellence because they are made by our exclusive Continuous Process—are setting new standards in tire manufacturing.

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of better, safer rayon cord tires...

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rayon for tires

Made by INDUSTRIAL RAYON CORPORATION
Cleveland, Ohio

LATEX & Its Industrial Applications (Vol. I)
LATEX & RUBBER DERIVATIVES (Vols. II & III)
& Their Industrial Applications.

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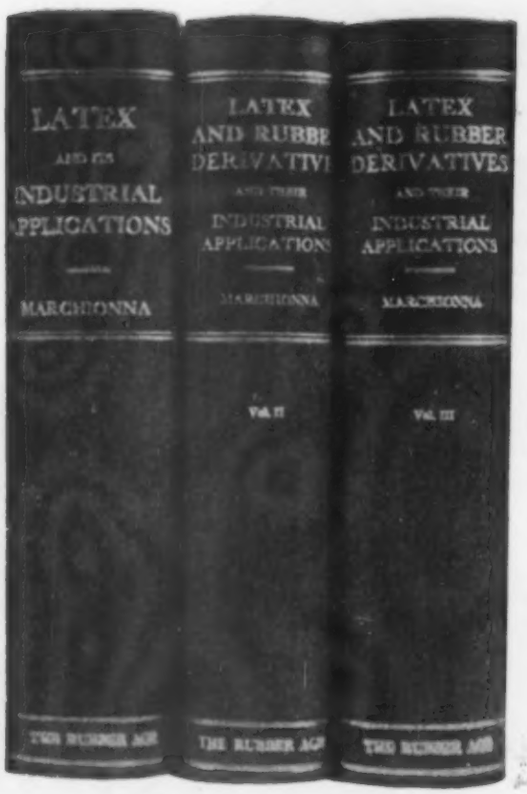
By FREDERICK MARCHIONNA



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"Invaluable source of reference."
BULLETIN OF RUBBER GROWERS' ASSN.

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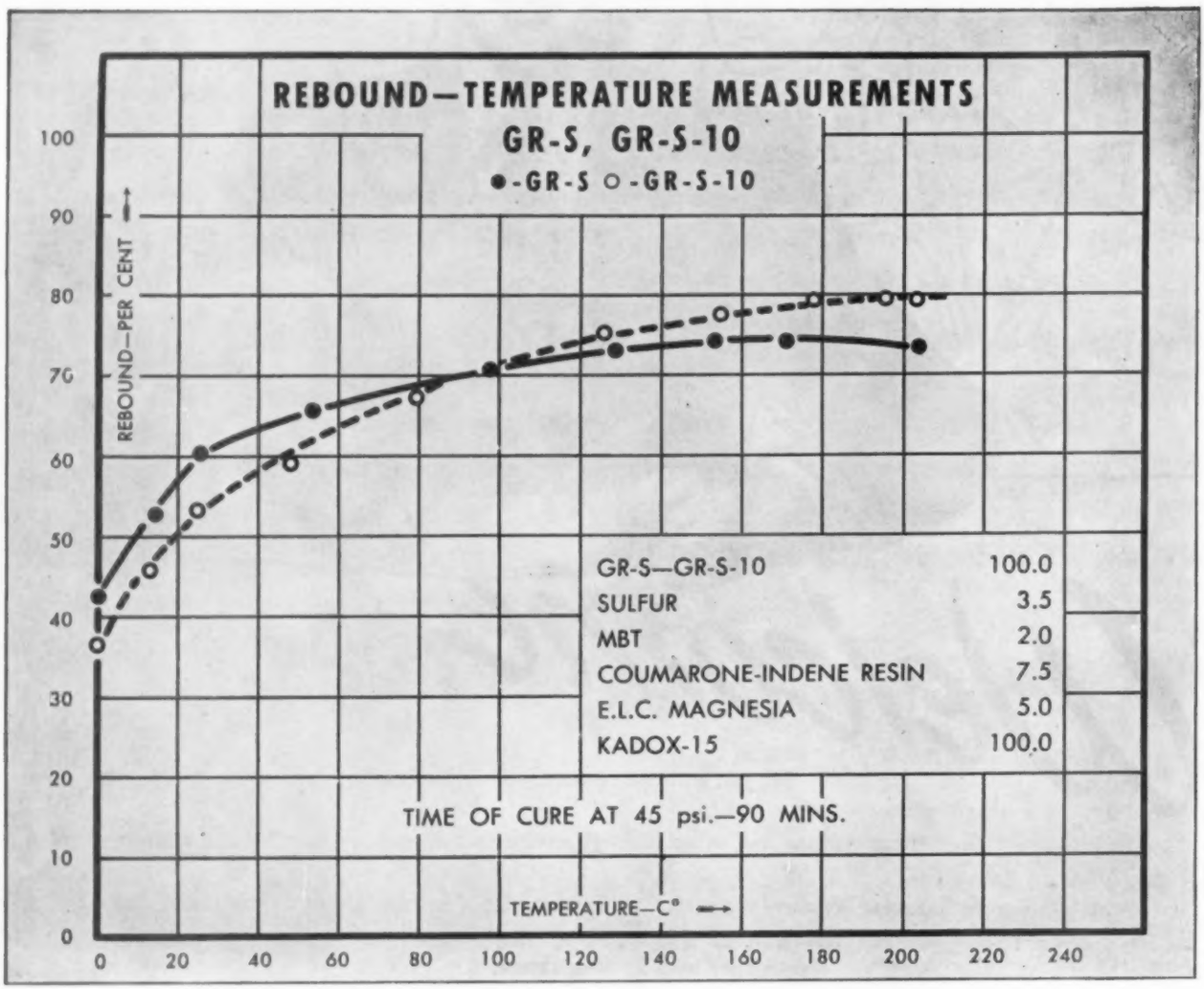
Technical Bulletin No. 20 — on the Compounding of GR-S with Substantial Loadings of Zinc Oxide

Rebound—Temperature Measurements GR-S and GR-S-10



THE room-temperature rebounds of the GR-S-10 Compounds, with 100 part loadings of Zinc Oxide, reported in previous Technical Bulletins (9, 10, 11, 13, 14, 16, 18, 19) are appreciably lower than corresponding compounds with regular GR-S, but the temperatures developed in flexing of GR-S-10 are generally lower than GR-S.

It was predicted that the rebound of GR-S-10 Compounds at elevated temperatures would be higher than GR-S. Data are now available for these compounds over the range 0°—200° C. that confirm the prediction. At approximately 100° C. the GR-S-10 rebound curve crosses the GR-S curve and reaches a maximum of 80%, while the GR-S levels off at 75%.

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New Jersey Zinc

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...a new name for an old and tested product

INDONEX as a plasticizer and extender in natural and synthetic rubbers is unique. The characteristics described below which are combined in INDONEX are not ordinarily found in one product. INDONEX meets diverse and exacting requirements.

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- **SMOOTH PROCESSING**—The lower processing temperatures and improved dispersion which can be achieved with INDONEX give smoother extruded and calendered products.
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- **GOOD PHYSICAL PROPERTIES**—Compounds containing INDONEX give good tensile strength, elongation, resistance to tear and flexing, and low compression set.
- **PERMANENCE**—Low volatility, good heat stability and high compatibility of INDONEX result in permanent elasticity and flexibility of natural and synthetic rubber products even when subjected to severe service conditions.
- **NON-BLOOMING**—INDONEX is highly compatible with natural and synthetic rubbers. High loadings show no tendency to sweat.
- **NON-BLEEDING**—No tendency for INDONEX to migrate has been observed.
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- **LOW VOLUME COST**—INDONEX used as an extender permits high carbon black loadings with good physical properties and results in low cost compounds of rubber, GR-S and Neoprene for various special purposes.
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Bulletin No. 13 gives detailed test results on the application of INDONEX in GR-S tread, carcass, inner tube, air bag, and other stocks, including stocks with high loadings of carbon black in GR-S and Neoprene.

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Under heat exposure, normally accelerated GR-S stocks exhibit marked depreciation in elongation as well as "creeping modulus." This condition can be improved by the use of low thiazole acceleration plus Activex, which is a true "kicker" and not a secondary accelerator.

● Bulletin upon request.

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The RUBBER AGE

VOLUME 59

NUMBER 1

One of the World's Outstanding Rubber Journals

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1. Gives better processing
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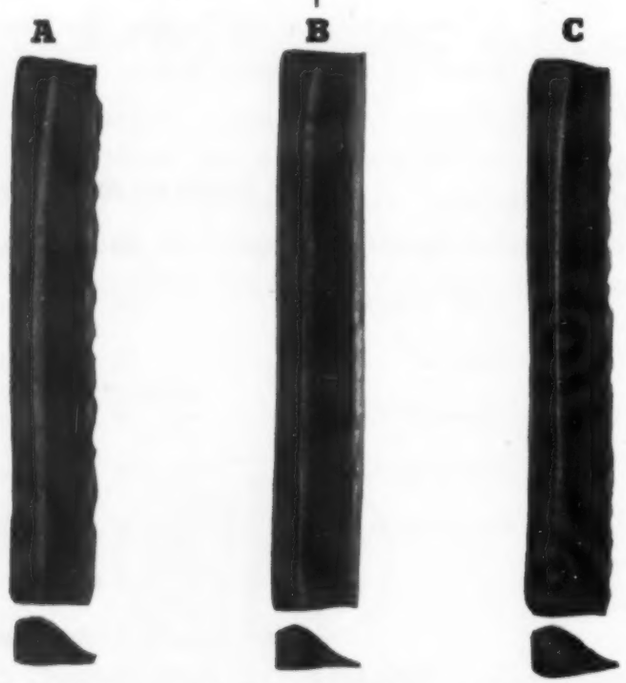

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- **PROTECT . . . with**

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Bulletin No. 93 gives full details of this test. Write for your copy.

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Division of United States Rubber Company

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RUBBER AGE

VOL. 59, No. 1 APRIL, 1946

Latex and Rubber Characteristics of Cryptostegia

By R. BLONDEAU and J. T. CURTIS

Botany Department, University of Wisconsin, Madison, Wisconsin

IN 1942 the Rubber Development Corporation effected a contract with a Haitian Agricultural Corporation, known as the Societe Haitiano-Americaine de Developpement Agricole (SHADA) for the establishment of 100,000 acres of *Cryptostegia grandiflora* in Haiti to assist in the production of natural rubber. An integral part of the program was the Cryptostegia Research Laboratory organized at Gonaives, Haiti *(17)*. The purpose of the laboratory was to study the problems arising from the large-scale use of such a commercially new and untried plant.

The research station consisted of a chemical laboratory, weather station, pilot processing plant, a nursery, and 30 acres of experimental plantings, while adjacent to the experimental plantings there was a 500 acre plantation for full scale field studies as well as for rubber production. In addition, numerous field plots were established throughout Haiti under a wide variety of environmental conditions in order that full measure could be taken of the capabilities and requirements of the plant. The permanent station staff consisted of two Americans and a force of local technicians and laborers. During the course of the research program several American specialists were associated with the station for short periods for the study of specific problems.

A somewhat similar program was undertaken about the same time by the British Government in India *(19)*. Several other laboratories and field stations in the United States, Mexico and Australia also were studying *Cryptostegia,* with a view to its utilization as a rubber source.

A great variety of problems were studied at the Gonaives Station, from the gathering of wild seeds to the baling and shipment of the finished rubber. This paper is an attempt to bring together the more recent available information on the latex and rubber charac-

John T. Curtis is currently Associate Professor of Botany at the University of Wisconsin and formerly was research director for SHADA at Port-au-Prince, Haiti. R. Blondeau was plant physiologist on the staff at Haiti. He is connected with the Shell Development Corporation and is on leave to finish some work at the University. The current work was prepared as a result of research conducted in the past several years in Haiti under the sponsorship of the Rubber Development Corporation. Although the usefulness of Cryptostegia as a practical rubber source under present conditions is highly doubtful, it is believed that the description of the chemical and physical properties of latex and rubber of the plant may be of value in respect to the knowledge of lactiferous plants in general. This is particularly true because Cryptostegia possesses so many characters that lend themselves to an experimental examination of the problem of the mechanism of rubber synthesis in vivo.—Editor.

teristics of *Cryptostegia,* not only to add to the general fund of knowledge of lactiferous and rubber-bearing plants, but also because it is believed that this plant, more than any other, offers the greatest possibilities for the fundamental study of natural rubber synthesis.

The genus *Cryptostegia,* a member of the milkweed family, consists of two species, *C. grandiflora* (the Palay rubber vine) and *C. madagascariensis* (the Lombiro rubber vine). Both are found in semi-arid, tropical regions, with the Lombiro form preferring slightly less arid conditions than the Palay. A hybrid between the two species was reported by Polhamus, Hill and Elder *(14)* and has been included in some of the current studies. Latex is found in all organs of the plants and can be obtained in quantity from the main stems or trunks, fruits and the long succulent canes or whips *(17)*. The latter source of latex was utilized on the plantations established in Haiti and India.

The bulk of the information available concerns latex from *C. grandiflora* whips, although there is some data on *C. grandiflora* fruits and trunks, as well as some on latex from *C. madagascariensis.* Wherever possible comparisons will be made. Unless otherwise indicated, the information reported here was obtained at the Cryptostegia Research Station of the SHADA Corporation, Gonaives, Haiti.

Physical Properties of Cryptostegia Latex

The latex, as it exudes from the plant, is a milky-white, opaque liquid with a pleasant fruity odor. From the fruits and whips of both species the latex is quite fluid, in contrast to that from the trunks, which is considerably more viscous.

The rubber, which constitutes the bulk of the solid matter in the latex, is in the form of colloidal particles. The following table gives the approximate size relationships of the particles from latices of the two species and their hybrid under a magnification of 970 × (2):

C. grandiflora		
whip	0.4μ	narrow range
trunk	0.8μ	range from 0.6μ to 1.4μ
C. madagascariensis		
whip	0.2μ and 1.1μ	two distinct size classes
trunk	0.4μ	narrow range
F_1 Hybrid whip	0.2μ and 1.1μ	like madagascariensis whip

Hendricks, Wildman and McMurdie *(7)* presented an electron micrograph of *C. grandiflora* whip latex showing the particles (which were greatly flattened by the methods of preparation) to be about 1μ in diameter, although some larger and smaller ones are visible. This agrees well with the above figure of 0.4μ for the particles under normal conditions.

Trumbull *(18)* determined particle size from a sample of whip latex in which part of the rubber was autocoagulated and found the particles to range from 0.2μ to 1.5μ with an average of 0.6μ to 0.7μ. The shape was found to resemble the tear-drop form characteristic of *Hevea* particles. Jumelle had reported in 1903 *(8)* that Lombiro latex particles ranged from 1.2μ to 2.4μ in diameter but he did not indicate the source or treatment of his samples.

The pH of all fresh *C. grandiflora* latices is between 5.2 and 5.6. There is a definite diurnal fluctuation in the pH of freshly exuded whip and trunk latex, the pH dropping during the morning and noon hours, then returning toward the original value in the evening. Upon standing in an open vessel at room temperature (24–30°C.) the pH of whip latex rapidly drops and within 24 hours reaches a value of about pH 4.0, remaining constant thereafter. The pH drop in stored latex is apparently the result of bacterial activity, as evidenced by the strong decomposition odors and by the fact that sealing the latex from air or storing at 40°C. slows, but does not prevent, these changes.

The specific gravity of whip latex, as determined by Viswa Nath *(19),* was found to vary from 1.0008 to 1.04, depending on season and time of collection. No agreement was found between specific gravity and rubber content of the latex. There is no data available on the surface tension of any of the latices.

The effect of acidity on latex viscosity was studied for both whip and trunk latex. With whip latex there is a marked increase in viscosity in the region of pH 2.3–2.8 followed by a secondary peak about pH 1.3–1.4 and on the alkaline side there is a small peak about pH 7.9–8.0. Trunk latex exhibits these same changes, but on a greater scale. The changes in viscosity with pH for both whip and trunk latex are shown in Figure 1.

Both latices are very unstable in the alkaline region of high viscosity, agitation causing partial or complete coagulation, thus making difficult the replication of results with the usual types of revolving viscosimeters.

The dilution of trunk latex with distilled water brings about a reduction in its viscosity. A sample of fresh trunk latex at pH 4.67 and at 28.1°C. had a viscosity of 9.7 centipoises. A dilution of 3 parts latex to 1 of water reduced the viscosity to 6.3 centipoises, while equal volumes of latex and water reduced it to 2.2 centipoises.

Temperature increases also serve to reduce trunk latex viscosity. At 0°C. a sample of latex had a viscosity of 11.8 centipoises, which was reduced to 2.9 centipoises at 38°C.

Whip latex is not stable mechanically, any agitation bringing about the formation of lumps and strings of coagulum. This tendency to coagulate can be overcome to some extent by the use of floating covers during transport, or by other means which will eliminate all air space and thus prevent splashing. Trunk latex is far more stable than whip latex to mechanical agitation. The action of a Waring Blendor brings about the rapid and complete coagulation of whip latex *(1),* while trunk latex requires a more prolonged beating in the blender (2-5 min.) which results in a cheese-like mass of rubber and not a hard coagulum as in the case of whip latex. There is the possibility that the beating of air into the latex by the machine is as much responsible for coagulation as is the mechanical action itself.

A good degree of mechanical stability can be imparted to whip latex by the use of formic, acetic or hydrochloric acids. When added to the latex in sufficient amount to reduce the pH to 2.0–2.5, these acids will maintain most of the rubber in suspension despite vigorous and prolonged agitation. Of the three, formic is the most effective and hydrochloric the least. The mineral acids tend to produce a partial agglomeration of the particles with resultant accelerated creaming. These acids also serve as bacteriostatic agents in addition to their role as anticoagulants. Trunk latex can

be preserved and stabilized against mechanical agitation for indefinite periods of time by the rapid addition of sufficient NaOH to bring it to pH 11. By lowering the pH to normal values the latex can be coagulated by the usual means.

Although creaming will occur naturally in whip latex, the separation into cream and serum layers will take place more rapidly and completely in latices of low rubber content, such as those obtained by several successive tappings of the same whips. Latex from the first tapping of a whip creams more slowly and far more rubber particles remain suspended in the serum. Periods of as long as 48 hours often are required for the serum to become entirely free of rubber. Trunk latex seldom creams naturally although the upper layers of latex may become very viscous. The degree and rate of creaming of whip latices can be increased by the addition of mineral acids (hydrochloric, sulfuric), certain organic acids (citric, tannic), or sodium chloride. Jumelle *(8)* noted in 1903 that the creaming of *C. madagascariensis* trunk latex could be accelerated by sulfuric acid. The addition of sodium or ammonium alginate to *C. grandiflora* whip latices is either without effect or produces a retardation in the creaming rate, in contrast to their accelerating effect on the creaming of *Hevea* latex.

If allowed to stand in open vessels without preservatives, the pH of the latex drops and decomposition of certain constituents, probably proteins, occurs, since hydrogen sulfide is quite evident in old trunk latex. Partial to complete auto-coagulation results in several days with whip latex, particularly with small volumes. Viswa Nath *(19)* reported complete auto-coagulation in a week at temperatures of 28–30°C. When latex is stored in large drums or tanks it can be kept in good condition for periods of a month with floating covers. Occasionally a skin of dried rubber will form over the surface of the latex, and serve the same purpose as a floating cover. A wide variety of fungi have been observed growing on this surface skin.

Chemical Properties of Cryptostegia Latex

Components and Proportions: The total solids (T.S.) and coagulable rubber content (D.R.C.) of the various *Cryptostegia* latices as obtained at Gonaives are summarized in the following table:

C. grandiflora	T.S.%	D.R.C.%
First Cut Whip	17.2-24.5	6.6-17.7
Factory Whip	9.5-13.6	4.4-7.6
First Cut Fruit	24-30	18-24
First Cut Trunk	40-47	34-43
Factory Trunk	35-41	26-34
C. madagascariensis		
First Cut Whip	15.1	7.7-8.5
First Cut Trunk	56.6	Ca. 54

The first-cut whip values represent the range from over 100 separate determinations. An analysis of these values yielded an average of 20.35% with a standard deviation of ±1.02% for the total solids and 11.60% ±1.25% for the coagulable rubber content.

The factory-whip data was obtained from bi-weekly sampling of bulked factory latex during a seven months operating period. The *C. grandiflora* trunk and fruit values represent ranges obtained during numerous experiments. The *C. madagascariensis* trunk value is a single determination. The variations are the result of season, age of plant, time of day and tapping and collecting techniques.

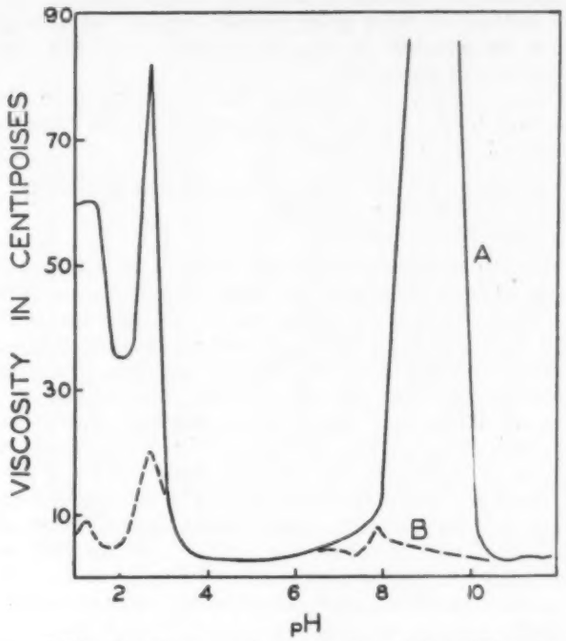


FIG. 1—Changes in viscosity with pH for trunk latex (A) and whip latex (B) of Cryptostegia grandiflora.

Viswa Nath *(19)* reported a total solids range of 19-32% and a rubber content of from 10.19-21.23%, presumably all from *C. grandiflora* whips. Many reports have indicated similar values.

Numerous analyses of latex total solids have been made, particularly for water and acetone soluble components. The following table summarizes these results. All acetone extractions were made on samples which had been extracted previously with water.

Solids Source	WE (%)	AE (%)	Insol. (by differ.) (Largely RHC)
C. grandiflora			
First cut whip	25.2-36.0	5.94-8.60	56.35-67.78
Factory Whip	.....	7.5 -10.8	.....
First-cut Fruit	20.2	6.25	73.5
Factory trunk	4.2-10.8	4.7 -6.5	83.1 -91.1
C. madagascariensis			
Whip	28.6	51.8	19.6
Trunk	0.61- 4.0	3.5 -3.8	92.2 -96.8

The first-cut whip values were obtained from 46 separate analyses. The deviations are as follows:

	Average	*Deviation*
WE	29.75%	±3.04%
AE	7.08%	±0.71%
INSOL.	63.14%	±3.29%

Some indication of the nature of the water and acetone soluble fractions of the total solids is given by the results of the following experiment: A large sample of first-cut whip latex was dried and the solids divided into two portions. One portion was extracted first with acetone and then with water, and the other was treated in the reverse manner. The data is pre-

	% of T.S.
Extractables Acetone Soluble	13.1%
Extractables Water Soluble	27.5%
Extractables both Acetone and Water Soluble	5.9%
Total Acetone-Water Solubles	34.7%

This clearly indicates that any values on the acetone extract of total solids would depend to a large degree on whether or not the sample had been previously water extracted.

Viswa Nath *(19)* reported the following data for free and total acid and unsaturation of the acetone extract of whip total solids:

Acid value	16.1 (Expressed as NaOH)
Saponification value	179.1
Iodine value	6.75

The ash content of first-cut whip total solids was found to be 2.48% and the total nitrogen content to be 1.63%. However these values change markedly from day to day on the same stems. A daily analysis of the total solids over a 30-day tapping cycle of normal whips showed that the ash content rose rapidly to a value of 8.5% at 7 days, remaining essentially constant thereafter. The nitrogen content increased to a value of 3.26% at the 4th day, followed by a drop to about the original value for the rest of the cycle. These data indicate the necessity for the careful qualification of the source of any solids used for analysis, and similarly, the necessity for bulking latex for factory operations for the manufacture of a uniform product.

A duplicate analysis of regular run trunk solids gave a total nitrogen content of 1.48% and an ash content of 1.66%.

Serum Constituents: The serum from *C. grandiflora* whip latex is undoubtedly a complex of many substances, very few of which have been isolated and identified. Although the data is very scanty the following information will give some idea of the complexity of the serum components.

Mercier and Balansard *(12)* isolated from *C. grandiflora* stems and roots two substances of glucosidal nature. One of these was a saponin and the other, which was more toxic, was also definitely alkaloidal in character and very similar to digitalis in physiological action. They also report that the leaves are toxic and the latex strongly emetic. The presence of the saponins is readily seen in the ease with which the latex foams when agitated.

When whip latex is dried, as for the determination of total solids, a thin layer of solid material results which is brown in color, probably indicating the presence of oxidized phenols. Both solids are hygroscopic, particularly the whip solids, which become moist on the surface in a very few minutes on exposure to the air.

A very prominent feature of the dry solids is the abundant quantity of needle-like crystals, which are noticeably hygroscopic. Viswa Nath *(19)* reported the isolation from whip serum of needle-like crystals with a melting point of 236-237°C., which had a bitter taste and contained nitrogen. Stewart and Hummer *(16)* found in whip latex a substance inversely correlated with the rubber content. They describe the substance as birefringent platelets, with a bitter taste, charring at 180°C. and melting at 234-236°C. The substance is soluble in water and ethyl alcohol, insoluble in petroleum ether and benzene. The substance may be a phenolic compound but no positive identification has been reported as yet.

No detailed analyses have been made of the organic nitrogenous constituents of the latex but some general data are available. A sample of whip latex serum, obtained by treatment of latex in a Waring Blendor was found by Rhines and McGavack *(15)* to contain 0.3%N. Abundant precipitation occurred in the serum at pH 7.5 and again at pH 9.9. The first precipitate analyzed 2.8%N which was only 2.7% of the total N, and the second 5.2% which was 14.0% of the total N. Both of these values are less than would be expected if the precipitates were proteins. A formol titration showed that 34.5% of the total nitrogen was amino nitrogen. United States Department of Agriculture investigators at Cuidad Victoria, Mexico *(11)* found that about one-half of the total protein content of the serum was precipitated by the addition of an equal volume of saturated ammonium sulfate solution.

Rhines and McCavack *(15)* found that of the metallic elements in the serum, Na, K, Mg, P and Li were present in greatest abundance, with traces of Fe, Si and B and a faint trace of Cu and Mn. At Gonaives a sample of whip serum was analyzed for inorganic constituents, using colorometric tests of the type used in soil solution analysis. Ammonia nitrogen was present to the extent of 150 ppm., potassium—200 ppm., phosphorus—4 ppm., and calcium—20 ppm. Although no tests could be obtained for nitrate nitrogen or magnesium due to the development of interfering colors, it was believed that the former was present only in low concentration, if at all.

Titration studies of both latex and serum have yielded some interesting results. A remarkable buffering action is exhibited by whip latex in the range pH 8.4-11.0 and by the serum in the range pH 8.0-11.0. Trunk latex shows two regions of buffer activity. On the acid side the buffering is more pronounced than that of whip latex or serum and covers the range pH 1.5-4.5. The buffer action on the alkaline side is not so prominent as that of whip latex and covers the range pH 9.5-11.5. Typical titration curves are presented graphically in Figure 2.

Rhines and McGavack *(15)*, from their titration studies of the whip serum, postulate the presence of phenols to account for the buffer action exhibited between pH 8-12.

Whip latex is yellow between pH 7 and 10 or 11 and is white on either side of this range. In the latex and serum from *C. madagascariensis* the yellow color does not develop so rapidly. The color will disappear upon acidification of the serum (or latex) if the exposure to alkaline conditions has not been more than a few minutes. The same yellow color develops in old serum and it has been found that the substance can be isolated from the serum by means of lead acetate. The lead addition compound, when decomposed by hydrogen sulfide, was found to contain all the yellow, alcohol soluble substances.

At the high pH levels the yellow color of the serum becomes brown and finally black. This change can be effected more rapidly by vigorous aeration. These color changes are similar to those exhibited by some phenols.

A number of color reaction tests have been conducted on whip latex using a variety of metal salts. Brilliant colors were imparted to the latex by many soluble salts of iron, molybdenum, manganese and chromium. The iron salts produced a deep blue color at the existing pH of the latex. A rough titration of 100 cc. latex plus 0.5 g. $FeCl_3$ showed the following color changes: pH 0.84—light tan, pH 2.55—light green, pH 3.38—light blue, pH 5.33—blue violet, pH 6.91—purple, pH 8.30—red with purple cast, and pH

11.50—deep red-brown. Molybdenum was found to produce a brilliant orange-red color in the latex.

C. madagascariensis whip latex showed similar color reactions, indicating the presence of the same compounds. The serum from the trunk latex of both species exhibited the same reactions although to a lesser degree. The trunk latex from both species showed no reactions probably because the high rubber content masked the colors.

In a search for pure substances which would give the same color reactions a number of chemicals were tested. These were principally phenolic substances because their presence was suspected from other data. Of the 10 phenolic materials tried, only pyrocatechin showed the same color with molybdenum and the same color changes with pH in the presence of iron salts. It was assumed that this phenol or a substituted relative was probably responsible for the color changes in the latex.

A number of curves of the oxidation-reduction potential were determined by serum titration with $KMnO_4$. Again, in a search for pure phenols which would duplicate these curves, it was found that a mixture of equal parts of catechol and pyrogallol was the best, although not producing curves of exactly similar shape.

From all of the above information it seems reasonably certain that phenolic substances play a prominent role in the observed reactions of whip latex and serum.

U.S.D.A. workers in Mexico *(15)* studied the enzymes present in the latex, using serum from mechanically coagulated latex. Highly active peroxidase was found in the whip latex of both species and the hybrid. Oxidase was also found. No catalase or tyrosinase was found in *C. grandiflora* latex but catalase was found in *C. madagascariensis* and the hybrid.

A substance with blue-purple fluorescent properties is present in the serum and is slightly soluble in ethyl ether. Harvey *(6)* reported the presence of flagellates in the latex of *C. grandiflora*.

Latex Coagulation

Coagulation of *Cryptostegia* latex can be brought about by a variety of agents. Perrier de la Bathie reported coagulation of Lombiro whip latex by alcohol in 1899 *(8)*. Simple water dilution of the latex from *C. grandiflora* results in coagulation, as was first shown by Redo in 1911 *(3)* and later confirmed by Trumbull in 1942 *(18)*. Trumbull also showed that sodium soap in a concentration of 0.5% on the latex was a good coagulant.

It was found in the work at Gonaives that coagulation could be achieved by the proper use of any of the following diverse agents: anionic and cationic synthetic detergents, hexylresorcinol, natural gums from certain leguminous trees, colloidal resins like gum guiac or sodium resinate, alkalies, heavy metal salts, acetone, formaldehyde, sodium chloride and *Hevea* latex.

Coagulation apparently can be effected by the action of surface active agents, protein denaturizers, dehydration agents and discharge agents, thus indicating a fairly complex type of particle stabilization. Of all the coagulants listed above, only water and the synthetic anionic detergents proved useful on a practical scale. Of the many possible types of the latter group, Nacconal N.R. was chosen because of certain superior properties.

Most of the substances used to coagulate *C. grandiflora* whip latex will also coagulate trunk latex. *C. madagascariensis* whip latex can be coagulated with water, Nacconal, acetone and alcohol—others have not been tried. *C. madagascariensis* trunk latex has been coagulated with Nacconal.

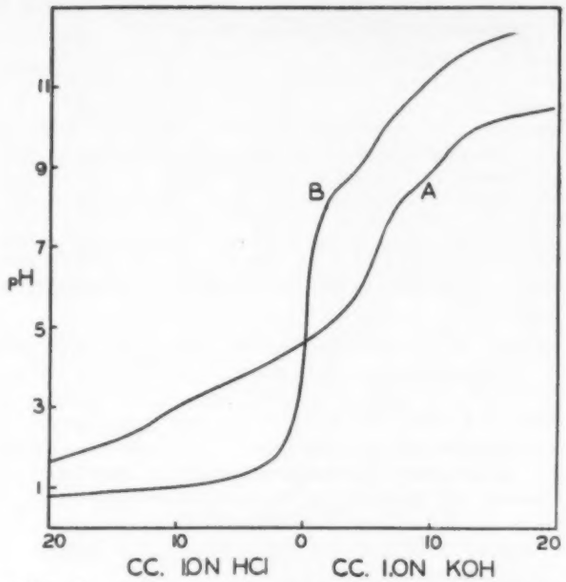


FIG. 2—Titration curves of trunk latex (A) and whip latex (B) of Cryptostegia grandiflora.

Water was used in the ratio of 6 volumes to 1 volume of latex. This proportion will vary somewhat depending on the latex but usually lies between 5 and 7 volumes. In from 10-30 minutes a loose stringy coagulum is formed which floats on the serum. It can be readily rolled after it has been compacted by hand. Water coagulation with fruit or trunk latex is slower and produces a gel-type coagulation because of the greater rubber content. These coagula are more easily handled than the whip coagulum.

Nacconal is used in the form of a 1% solution in water and is added to whip latex at the rate of about 250 cc, per 3 liters, which is roughly 1% dry Nacconal on the rubber (experiments have shown that the Nacconal-rubber relationship is approximately stoichiometric). A gel is formed in from 10-30 minutes, which must be compressed by hand before milling. Fruit and trunk latex respond similarly to Nacconal, although requiring more Nacconal solution because of higher rubber content.

There is essentially no difference in the quality of the sheets produced by the two methods. Both methods are convenient and about equal in cost. Water gives a slightly lower yield of sheet rubber because small pieces of the stringy coagulum do not adhere to the sheet, although these can be recovered as scrap.

Physical Properties of Cryptostegia Rubber

Physical property tests have been made by the National Bureau of Standards, the U.S.D.A. Eastern Regional Laboratory, and several industrial laboratories, on regular factory-run rubber produced from the Gonaives plantation. Whip rubber coagulated with Nacconal, water or salt, trunk rubber coagulated with Nacconal or water, and water-coagulated fruit rubber have been tested. Some typical results obtained on

vulcanizates compounded with the N.B.S. formula IA are presented in the following table:

Description of sample	Mooney Visc. ML (212°F.)	Opt. Cure (min.)	Ult. elong. (%)	Tensile in #/sq. in. at opt. cure
Whip—Nacconal	96.8	30-45	808	2887
Whip—water	100.2	30	808	3030
Whip—salt	87.8	30	823	2920
Trunk—Nacconal	109.0	30	870	3120
Trunk—water	105.0	30	850	1880
Fruit—water	109.0	90	780	2310

Formula IA = Rubber-100, ZnO-6, Stearic acid-4, Captax-0.5, S-3.5.

It must be remembered that the formula employed in this compounding is that used for all wild rubbers, regardless of their botanical source. Consequently the results obtained with it do not give necessarily a true picture of the qualities of the rubber. Several other tests using formulas adjusted to the particular properties of this rubber have given more favorable results, with tensiles of gum stocks at optimum cure as high as 3350 for *C. grandiflora* whip rubber and 3520 for trunk rubber *(4)*.

On the other hand it has been found that *Cryptostegia* tread stock definitely shows poorer running temperatures and stress-strain properties than *Hevea* smoked sheet *(17)*. It is comparable to massed smoked sheet in processing properties, although producing softer stocks. The dispersion of carbon black in *Cryptostegia* rubber is good, although not as good as in smoked sheet. In spite of the fact that the rubber initially contains a considerable amount of fatty acids, it requires a high concentration of stearic acid to bring out its best qualities *(4, 17)*.

Morris, Barrett, Harmon and Werkenthin *(13)* conclude as a result of their tests on the blending of natural rubbers with GR-S that *Cryptostegia* is second to *Hevea* in order of preference.

Hall, Hauser, LeBeau, Schmitt and Talalay *(5)* report from their studies of thin rubber films with the electron microscope that *Cryptostegia* rubber is similar in its morphological characteristics to that of *Hevea*. McGavack *(10)* and Trumbull *(18)* have shown by means of X-ray studies that *Cryptostegia* rubber is identical to the cis-polyisoprene rubber of *Hevea*.

The density of *C. grandiflora* trunk rubber has been determined by the N.B.S. to be 0.923 at 25°C., while Jumelle *(8)* reported the density of *C. madagascariensis* rubber as 0.929.

In *C. madagascariensis* whip latex the rubber is largely replaced by a terpene resin which is soluble in acetone but not in water.

A number of analyses of whip rubber have been made by various laboratories which can be summarized as follows:

A.E.	11—13%	Ash	0.5—0.7%
W.E.	1— 2% (or less)	RHC.	77—85%
N	0.3—0.7%	Insol.	1.0—3.5%

Fewer analyses have been made of the trunk rubber, but definite differences are apparent, particularly in acetone extract and R.H.C.

A.E.	7.7—9.0%	Protein	0.4%
W.E.	1— 2%	RHC.	89—91%
Ash	0.7%	Insol.	0.6—3.5%

The solubility of whip and trunk rubber in various mixtures of benzene and methyl alcohol has been studied according to the methods of Kemp and Straitiff *(9)*. In these studies, Nacconal coagulated sheets of whip and trunk rubber were used which had been previously extracted exhaustively with acetone and water.

A 1% solution of each of the above two types of rubber was made in pure benzene and then decanted from the insoluble residue. To aliquots of this solution methyl alcohol was added in varying amounts. The precipitated material was allowed to settle, the remaining solution poured off, then the residue set with pure methyl alcohol, dried and weighed. The percentage solubility in the various mixtures was calculated by subtracting the weight of the precipitate in each case from the weight of the rubber precipitated from the original benzene solution by the addition of an equal volume of MeOH. The results are shown below:

Final MeOH Concentration	Percent in Solution—Whip	Percent in Solution—Trunk
0%	100	100
13.0	99.6	—
16.0	94.4	99.8
19.0	14.1	18.7
19.9	—	9.2
20.9	4.7	0.8
21.6	2.0	0.3

It is apparent that there is a sharp break in solubility between 16% and 19% MeOH. The whip rubber is more soluble, under these conditions, over the range of alcohol concentrations used—*i.e.*, it has a greater range of polymer lengths than the trunk rubber, at least in that portion of the original sample that dissolved in benzene.

Among those who have worked with *Cryptostegia* there is definite agreement that the plant should not be cast aside now that the emergency need for rubber has passed. It is believed that this plant more than any other offers excellent possibilities for the study of natural rubber synthesis. *C. grandiflora, C. madagascariensis,* and their hybrids exhibit extremely wide ranges of resin-rubber ratios, not only among the various genetic forms but among the various latex producing parts of individual plants themselves. Coupled with this is the fact that *Cryptostegia* offers abundant and easily manipulated experimental material. It is a vigorous and rapidly growing plant under favorable environmental conditions, it fruits heavily, produces abundant viable seed and can be easily propagated by grafting.

A thorough investigation of the enzyme systems, latex constituents and general metabolism of the whips of *C. grandiflora* (low resin-rubber ratio) and the whips of *C. madagascariensis* (high resin-rubber ratio), for example, might yield invaluable information on the mechanism of rubber synthesis. It is conceivable that an understanding of the reason for the remarkable difference in rubber production by two otherwise very similar plants could easily lead to natural rubber synthesis *in vitro*.

Summary

Information is presented on the physical and chemical properties of *Cryptostegia* latex and rubber, and on the agents and methods used in coagulation. Comparisons are made between *C. grandiflora, C. madagascariensis* and their hybrid. A comment on the use of the plant in basic research on natural rubber synthesis is included.

LITERATURE REFERENCES

(1) Curtis, J. T., Cryptostegia Research Reports, Port-au-Prince, April, 1943. Processed.

(2) Curtis, J. T. and R. Blondeau, Cryptostegia Research Reports, Port-au-Prince, July, 1944. Processed.

(3) Dolly, C. S., On the Occurrence of Palay Rubber *(C. grandiflora* R. Br.*)* in Mexico, *I.R.J.*, **41**, 1156-1158 (1911).

(4) Eskew, R. K. and M. J. Copley, Recovery of Plug Rubber from *Cryptostegia grandiflora.* U.S.D.A. Eastern Reg. Lab., Philadelphia, July, 1945. Processed.

(5) Hall, C. E., E. A. Hauser, D. S. LeBeau, F. O. Schmitt and P. Talalay, Natural and Synthetic Rubber Fibers—Electron Microscope Studies, *Ind. Eng. Chem. (Ind. Ed.)*, **36**, 634-640 (1944).

(6) Harvey, R. B. and S. B. Lee, Flagellates of Lactiferous Plants, *Plant Physiol.*, 18, 633-655 (1943).

(7) Hendricks, S. B., S. G. Wildman and H. F. McMurdie, Morphology of Latex Particles as Shown by Electron Micrographs, *I.R.W.*, **110**, 297-300 (1944).

(8) Jumelle, H., "Les Plantes a Caoutchouc et a Gutta dans Tous les Pays Chauds", published by A. Challamel, Paris (1903).

(9) Kemp, A. R. and W. G. Straitiff, Structural Features of Buna S, *Ind. Eng. Chem. (Ind. Ed.)*, **36**, 707-714 (1944).

(10) Lerner, M. E., Domestic Rubber Plant Investigations Launched by United States Rubber Co., *R.A. (N.Y.)*, 51, 213-214 (1942).

(11) Lindgren, R. M., W. S. Stewart and R. W. Hummer, United States Department of Agriculture Cryptostegia Research Project, Quarterly Reports, Cuidad Victoria, Mexico, March 31, 1945.

(12) Mercier, F. and J. Balansard, Recherches chimiques et pharmodymanique sur les principes cardiotoxiques du Lombiry *Cryptostegia madagascariensis, Compt. Rend. Acad. Sci. (Paris)*, **195** (26), 1427-1429 (1932).

(13) Morris, R. E., A. E. Barrett, R. E. Harmon and T. A. Werkenthin, Effect of Blending Natural Rubbers with GR-S, *Ind. Eng. Chem. (Ind. Ed.)*, **36**, 60-64 (1944).

(14) Polhamus, G., H. Hill and A. Elder, Rubber Content of Two Species of Cryptostegia and of an Interspecific Hybrid in Florida, U.S.D.A. Tech. Bull. No. 457, pp. 1-22 (1934).

(15) Rhines, C. E. and J. McGavack, Examination of Serum from *C. grandiflora* Latex. Passaic, N. J. July, 1943. Processed.

(16) Stewart, W. S. and R. W. Hummer, Inverse Correlation between Rubber Hydrocarbon and a Crystalline Fraction Isolated from Latex of *Cryptostegia grandiflora, Bot. Gaz.*, **106**, 333-340 (1945).

(17) Symontowne, Russ, Cryptostegia Research in Haiti, *I.R.W.*, **108**, 148 (1943).

(18) Trumbull, H. L., Growing Rubber in North America, *Ind. Eng. Chem. (Ind. Ed.)*, **34**, 1328-1335 (1942).

(19) Viswa Nath, B., *Cryptostegia grandiflora* R. Br.—A Wartime Source of Vegetable Rubber, *Jour. Sci. and Ind. Res. (India)*, **1**, 335-383 (1943).

Progress of Plantation Research in Ceylon

THE latest report of the Rubber Research Scheme (Ceylon) covering activities in 1944 in Ceylon reveals the following highlights:

Modified Rubbers: Using a process developed by the Rubber Research Institute of Malaya, in what is thought to be the first commercial application, 15,000 pounds of softened rubber was prepared for a local firm.

Plasticity: With a view to selective breeding of trees which have been found to yield more plastic rubbers, the quality of plasticity is receiving attention. Over a period of two years, the plasticity of the rubbers from a number of individual trees has been observed to remain relatively constant. Between one group of selected trees and their clones a correlation coefficient of +0.472 in their rubber plasticities was noted.

Tackiness: The extent to which crepe rubber can be protected against tackiness, due to sunlight and heat, by the addition of chemicals to the latex, is being explored. So far, the chief conclusion drawn from the tests is that under the conditions observed, the onset of tackiness can be completely arrested by sulfur (0.05 to 0.10 per cent) and by phenyl B-naphthylamine (0.1 to 0.2 per cent). The application of the knowledge gleaned to the prevention of tackiness under field conditions remains to be made.

Oidium Leaf Disease: Oidium leaf-fall on some low-country estates during 1944 was the worst ever experienced. Oidium (a form of mildew) attacks the newly-formed foliage, following wintering, and varies in incidence, according to whether wintering coincides with the Oidium season. Hopes had been indulged that manuring might mitigate the severity of attack but, judging from an experiment on budded rubber reported, it may have the opposite effect. Here, manuring, by promoting late wintering, led indirectly to increased Oidium. From the fact of common observation on rubber estates, that it is the porest trees which are the first to winter, the foregoing result might have been prophesied. It would appear to make the prospects of prophylactic treatment against Oidium very unhopeful.

Planting Material: Under Ceylon conditions, the hand pollination of Hevea appears to encounter especial difficulties. Out of 12,422 pollinations reported in one experiment, only 162, or 1.3 per cent proved fruitful. These poor results were mainly obtained with PB.86 trees. Another clone gave over 20 per cent successes.

Budgrafting: It is known that budgrafts derived from buds taken low down on the seedling stem tend to resemble seedling trees much more than normal budgrafts. The stem is corky, and more conical, and the union is not so well marked. To explore further the differences in budgrafts from high and low buds, experiments using branch as well as stem buds have been started.

Tapping: In some tests of tapping systems on budded rubber, the relative yields have changed considerably as a result of a sharp increase in the amount of Brown Bast. The report seems to indicate that the increase in the number of cases of this affection in budgrafted rubber is being viewed with concern. As illustrating the effect of heavy tapping on growth, it is worth noting that the adoption of the "Double-Three" system led to a big decrease in the rate of girth development of buddings. Continuing the tests of intensive methods of tapping, experiments in high (ladder) tapping are in progress. These are being compared with "Upward" tapping. So far, there seems little difference in the yields, but it has been found that tapping a high cut with a ladder takes about twice as long as tapping an upward cut.

Transporting Materials Safely with Power Trucks and Tractors

By C. B. COOK
Vice-President,
Elwell-Parker Electric Co.,
Cleveland, Ohio

BASIC principles for transporting materials safely by means of power industrial trucks and tractors were presented in Safe Practices Pamphlet No. 55, published by the National Safety Council in 1940. The principles have proved to be sound and are as applicable to all industries today as they were five years ago. The question now is how they have been applied, for example, in the rubber industry; with what results, and has experience been acquired during the war period to give more specific direction to safety efforts?

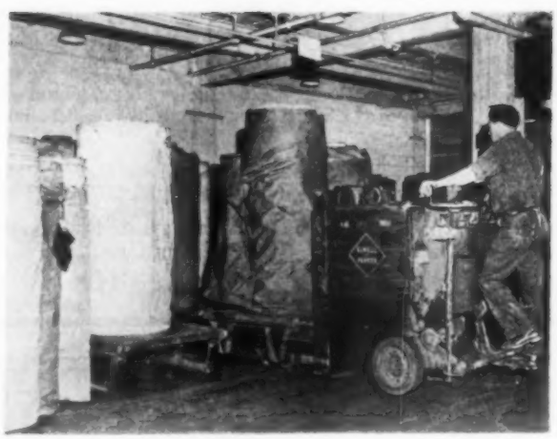
Versatility of trucks and tractors as aids in procurement, production and distribution of materials and finished products has become more clearly understood. System in their maintenance and operation—hence safety—has developed with that understanding.

Appreciation of the value of this type of equipment manifested itself strongly when industries had to increase production with reduced manpower. Virtually every one obtained more machines when they were required for essential services. The number in use and the diversity of their applications to various types of jobs grew by leaps and bounds.

The Army and Navy recommended them, and, as well known, the Services themselves solved one of their most difficult transportation problems with trucks and pallets.

Note: This material was originally prepared for presentation at the 1945 meeting of the Rubber Section of the National Safety Council. The meeting was not held because of transportation difficulties.

The rubber industry is among the largest users of mechanical equipment, such as power trucks and tractors. In this view are seen stout steel racks which provide double storage capacity, with headroom enabling the operator of the high-lift platform truck to store or remove skidloads of stock at any level, without disturbing any of the others.



Tons of fabric are handled by means of truck, safeguarding workers from hazards inherent in manual lifting.

Safety work was intensified as part of the war effort, though not because of any hazards inherent in any particular type of equipment. A truck can be a remarkably useful machine, or a destructive one, depending on the care it receives and the manner and place in which it is operated. Safety directors have had to cope with the human element to an extent they never had to before. Opportunities for selection of drivers were limited, and in many localities, nil. Despite this, trucks unquestionably have prevented more accidents than they have caused.

Elementary points in their operation can be taught to any intelligent person in a few hours; they are no more complicated than are those observed in driving a road truck or automobile. An important difference, however, is that industrial trucks are machines for applying power in many directions, horizontally and vertically. They work in narrow aisles, among other machines in congested factory space. When fleets of them are constantly engaged in transporting many tons of materials—as in the rubber industry—the need for training and supervision is imperative.

A materials handler in this industry today is not a common laborer, such as he was a generation ago. He is a skilled operator of a truck or tractor. With his machine he does work that formerly required five to ten laborers—with less danger to himself and to others—and far more economically.

In seeking the right type of men for such employment, selections frequently are made from a company's

Truckloads of synthetic rubber are "spotted" at mixing machines so that the operator has a minimum of lifting to do in transferring rubber from the truck to the machine's conveyor.

own personnel, because opportunity has been afforded to note desirable characteristics. These principally are physical and mental alertness, good eyesight and hearing, evidence of common sense and aptitude.

The man who is capable of operating a truck but who "stunts," addicted to horseplay, and who shows contempt for safety rules is a menace. Safety men are on guard against his kind, because these traits are difficult to control, and an incorrigible driver sets a bad example wherever he goes. Furthermore, efforts to reform him generally are futile, and may lead to serious labor strife. All rubber manufacturers train men to operate the machines to which they are assigned, and instruct them in the principles of safety before they are given regular work to do.

One of the best examples of effective organization is that which centralizes activities pertaining to trucks and tractors in a transportation department, unencumbered by any other responsibilities. This is unusual, and may indicate a trend. The department was established on the logical point of view that many factors combine to promote consistent performance of men and machines. Maintenance is not merely undertaken with the thought of prolonging the life of the truck, it is "preventive" or "protective" maintenance to safeguard workers as well as property.

Proper loading has a three-fold meaning: chances for injury to men are reduced, there is less danger of damage to truck or loads, and loads are delivered intact on time, contributing to production. These points understood by competent operators and maintenance men promote not only safety, but production as well.

The department is under supervision of the safety director and an assistant who devotes all his time to it. It is responsible for 200 trucks and tractors, and many trailers. It has under its direction 485 employees.

Teamwork within this department and by the department with others has been largely responsible for reducing the plant's accident severity rate 4 points between the years 1941 to 1945. The frequency rate during this period of maximum production increased 2.2 points.

The great majority of injuries encountered in the operation of trucks and tractors were simple cuts and bruises. Less than 5 per cent of all injuries sustained in the plant from all causes were due to trucks striking or otherwise hurting workers who were not concerned in their operation. Eighty-five per cent of all personal-injury accidents involving trucks, tractors or trailers "happened" to beginners.

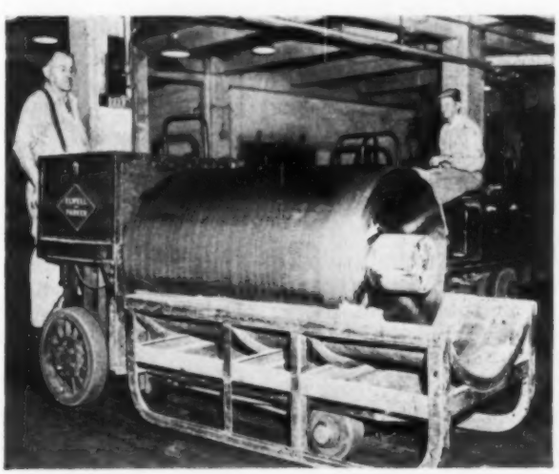
The newcomer to this department, if he is to operate a truck or tractor, is taken in charge by a trainer who explains the operation of the type and make of the machine with which he is to work. The trainer gives him a booklet containing rules of safe practices, which apply not only to the truck, but also to the movement of goods. The trainer suggests that he study and memorize them, and later quizzes him to make sure he understands them.

The trainer devotes three hours to instructing his pupil the first day. The remainder of the time the trainee observes how experienced men operate their trucks. The time the trainer devotes to him personally each day is progressively reduced, and at the outset of the second week the trainee works with an experienced operator—riding along with him on the machine, where that is practicable.

At the end of an 18-day preparatory period, the trainer gives the new operator an oral test. If he is considered competent and reliable he is given a written permit to operate the type of machine to which he has been accustomed. He cannot operate another type until it is determined that he understands it and is given written permission. Experience shows that an operator acquires the greatest degree of skill when he drives the machine with which he is familiar; an unauthorized switch to another type or model is considered an invitation to trouble.

The operator is held responsible for making sure that brakes, steering and signal mechanisms are in working order before starting on his shift. He is not permitted to tinker with the machine, to make adjustments or repairs. But he must report promptly any need for attention. A duplicate record of greasing is kept by the operator of the truck and the maintenance department; the operator must bring in the truck for greasing twice a month. Batteries must be charged every eight hours.

No speed limit is imposed. Speed has been important to production; it is permissible for trucks in



Special forms of cradles and racks, like the one above, have been devised for transporting various loads of fabrics.

good working condition with competent operators aboard. The mechanical limit for most medium and heavy-duty trucks is four to six miles an hour, though some machines are built for faster travel with lighter loads.

Operators in this plant are instructed to practice "defensive driving." A rule is: "Drive your truck anticipating that the other driver or workman may do the wrong thing. You cannot control his actions, but you can be so much on the defensive that no one can hit you or make you hit him."

Many factories are multiple-storied. Extreme caution is enforced in taking trucks and loads from one floor to another by elevators. Operators are instructed to approach elevator shafts at right angles. If that position is not possible, they must stop at least ten feet from the shaft.

One general rule is: "When loading an elevator be sure it is not in motion and that the floor of the elevator is lined up with the floor on which you are working. Drive onto the elevator with load first. Be sure your load, combined with the weight of the truck, does not exceed the weight capacity of the elevator. Return controller handles to neutral and step off the truck while riding elevator, being sure that the brake and cut-out pedals are in the off position."

An important part of an operator's training is how and where to place loads in relation to other machines and equipment. Loads are spotted precisely in a semi-circle at some machines so that operators of those machines need not change their position of movements while at their work.

A central dispatch system is controlled from the transportation department. The dispatcher knows at all times where trucks are in service; he routes them so that there is a minimum of delay in transporting material, and also so there is little backtracking of empty equipment. No operator is permitted to move a load without being directed to do so, unless he is engaged in routine, repetitive work such as loading or unloading freight cars, or moving material in or out of storage.

Loads to be moved are ticketed, and the foreman calls the transportation department, which then issues the order to the driver. The driver is instructed not to drive his truck empty, but to make every run count. If he has delivered loads as scheduled by the dispatcher, before returning with empty equipment he phones his dispatcher. He is impressed with the fact that his job is to move material, not simply to run a truck.

Another rule established by this department is this: "No operator shall transport a load if in his opinion the skid or skid bin is improperly loaded. If the loads are unsafely arranged, consult the supervisor first before taking any responsibility. Eliminate as much as possible the handling of loose pieces on flat skids."

Besides essential rules of safe truck operation, a number which apply particularly to the character of work in rubber and rubber products are included in booklets compiled by companies for distribution to their employees. As for example:

"Tie ropes are provided and are to be used on all skid loads of drums as well as any other material which may have a tendency to become dislodged and fall from the skids."

"No open drums or drums without bungs and lids containing liquids, solvents or cements shall be transported until bungs or lids are replaced and securely fastened. This procedure is to prevent spillage, loss of material, and exposure to ignition."

Power trucks and tractors form the basis of plant transportation systems in the rubber industry. Trailers of many types are in use, often developed especially for the loads carried.

Systematic maintenance is generally considered to be the most effective way of keeping trucks in service. A large percentage of them were built 15 to 25 years ago, and consequently they lack many safety features found in modern models. It is a credit to the builders that simple design and rugged construction have contributed to the long life of trucks.

But in the years that the old machines have been in use, outstanding improvements have been made in design and construction of new ones which are available today. Other equipment of early vintage has long since been scrapped. High-pressure pneumatic tires have given way to those of much better and safer design and construction. Similarly, safer, stronger, more adaptable trucks and tractors have appeared.

Thousands of machines, old and new, help to make the world's tires. Loads usually consist of rubber in various forms, fabrics, chemicals, finished products, molds, parts of other equipment—anything that needs to be moved. Slabs of rubber 30 to 35 inches and 3 to 4 inches thick are handled in packs of 4000 to 5000 pounds. Rolls of fabric 24 inches in diameter, 72 inches long, weigh 1000 pounds; molds up to 8000 pounds.

The ideal plant for rubber and tire manufacture is considered to be a well-lighted, single story structure, with wide, straight aisles, ample space. Today's industry has inherited many handicaps associated with cramped quarters. Plants and locations which were ideal a generation ago are not so regarded today.

Important economic questions have been in the forefront for years; particularly that of continuing to build in congested areas, or decentralizing. Decentralization has inviting prospects because it generally means modernization, which in turn provides for greater safety.

But how to go about this for the best interests of all concerned is one of the industry's chief problems. It is on the threshold of important technical developments which might affect its plans.

In the meantime, the safety director strives to compensate for all those obstacles over which he has no control, by studying them, organizing to cope with them, by vigilance, and infinite patience with "the human factor."

Structural Changes of Natural and Synthetic Rubbers during Mastication and Their Subsequent Recovery

By D. S. le BEAU* and E. A. HAUSER†

ALTHOUGH the changes which natural as well as synthetic rubbers undergo during mastication and subsequent recovery have been studied extensively, this problem is still of major interest, both from a strictly scientific as well as a technological point of view. The development of a new microscopic technique (*12, 14, 15, 16*) which permits visual observation of these changes has provided us with an entirely new tool, supplementing the indirect evidence so far accumulated by studies of viscosity (*1*), plasticity (*4, 5, 10, 19, 24, 27*), gelation (*1, 2, 22, 27*), unsaturation (*17*), and by drawing analogies from related but well defined chemical compounds (*8, 9*).

Previous investigations (*21, 25, 26*) have shown that great differences in the effect of mastication and recovery on natural and synthetic rubber can be obtained by varying experimental conditions. The effect of mill temperature (*4*), surrounding atmosphere (*3, 6*), friction between the rolls and time of milling (*10*), as well as mill gap have been studied in great detail. To avoid the introduction of too many variables at one time, it was decided to limit the scope of this investigation to one mill temperature for each rubber. Since at high mill temperatures the effect of heat on the rubber may be predominant over the effect of actual mastication, the mill temperature was kept as low as possible.

Since previous investigations (*7, 10*) had shown that the greatest effect of mastication is obtained during the first fifteen minutes of milling, it seemed advisable to use one batch from which small samples were removed during milling at previously designated time intervals. The change in batch size was comparatively small during the initial milling time intervals where the greatest effect of mastication is encountered. Since this procedure was adhered to throughout the investigations, both with natural as well as synthetic rubber, it can be classified as a constant experimental factor. The recovery phenomenon was studied with particular emphasis on short times, such as encountered in general practice of compounding and testing procedures in a factory.

* Midwest Rubber Reclaiming Co., East St. Louis, Illinois.
† Massachusetts Institute of Technology, Cambridge, Mass.

TABLE I—VISCOSITY DETERMINATION OF MASTICATED SMOKED SHEET

Time of Milling	Mastication		Recovery							
			1 Day		1 Week		3 Weeks		7 Weeks	
	$\frac{\eta\ Sol}{\eta\ S}$	% Conc.	$\frac{\eta\ Sol}{\eta\ S}$	% Conc.	$\frac{\eta\ Sol}{\eta\ S}$	% Conc.	$\frac{\eta\ Sol}{\eta\ S}$	% Conc.	$\frac{\eta\ Sol}{\eta\ S}$	% Conc.
0 min.	2.02	0.182	— —	— —	— —	— —	— —	— —	— —	— —
	1.44	0.102	— —	— —	— —	— —	— —	— —	— —	— —
	1.25	0.046	— —	— —	— —	— —	— —	— —	— —	— —
5 min.	1.88	0.398	2.05	0.445	1.65	0.308	1.74	0.309	2.23	0.451
	1.32	0.216	1.56	0.236	1.24	0.165	1.33	0.165	1.47	0.215
	1.17	0.137	1.20	0.130	1.10	0.098	1.15	0.086	1.21	0.109
10 min.	1.46	0.330	1.42	0.289	1.36	0.266	1.39	0.262	1.46	0.258
	1.22	0.171	1.28	0.156	1.12	0.138	1.19	0.132	1.20	0.139
	1.09	0.091	1.11	0.089	1.03	0.074	1.07	0.071	1.08	0.075
20 min.	1.37	0.319	1.60	0.445	1.31	0.312	1.41	0.331	1.40	0.298
	1.17	0.160	1.23	0.230	1.15	0.155	1.17	0.164	1.18	0.164
	1.09	0.091	1.14	0.132	1.03	0.098	1.09	0.096	1.08	0.087
30 min.	1.34	0.342	1.33	0.361	1.29	0.316	1.34	0.302	1.28	0.262
	1.13	0.182	1.14	0.153	1.14	0.154	1.13	0.154	1.17	0.143
	1.09	0.102	1.05	0.078	1.02	0.085	1.06	0.087	1.06	0.089
45 min.	1.28	0.352	1.38	0.372	1.24	0.303	1.33	0.339	1.34	0.296
	1.12	0.182	1.15	0.191	1.10	0.160	1.14	0.175	1.19	0.159
	1.09	0.102	1.06	0.109	1.05	0.088	1.08	0.096	1.07	0.087

Since the preparations for the microscopic studies were made from the solutions of the polymers, the determination of viscosity of the masticated and recovered samples was preferred to measurements of plasticity. To eliminate selective effects of different solvents on the polymer molecules such as volume of bound solvent, both viscosity determinations and preparations for the ultra-microscopic observations were made from benzene solutions. The viscosity determinations were carried out with an Ostwald viscosimeter, and the unsaturation was determined by the method of Kemp (*18*). The preparation of the microscopic slides has previously been described in great detail (*12, 14*).

Natural Rubber

200 grams of prime ribbed smoked sheet (acetone extract 2.6%, unsaturation 92.5%) were subjected to milling at 120°F. on a 6 x 12 laboratory mill (friction ratio 1:1.4, mill gap 0.025"). A small sample was cut off the sheet on the mill after 5, 10, 20, 30 and 45 minutes. One part of each of these samples was immediately dissolved in benzene, the rest was stored for 1 day, 1, 3 and 7 weeks respectively in small dark vials and then put into solution. Storage in dark vials was chosen because in practical operation the greater part of the rubber would not be exposed to light during storage. No acetone extraction was attempted since viscosity determinations were used for comparison purposes within the polymer only, and since a previous study on highly purified rubber obtained from crepe as well as smoked sheet by acetone extraction and subsequent precipitation of the polymer from its solution had shown that such small amounts of acetone removable matter do not influence the film formation of the polymer.

The changes occurring in the unsaturation of the various milled and recovered samples were so small that they might be attributed to experimental errors. This confirms the results of previous investigators. Table I records the changes in viscosity due to mastication and subsequent recovery (*20*). If one plots the viscosity of the recovered solution over the viscosity of the freshly masticated solution against the time of recovery, a curve for each of the respective time intervals of milling is obtained which shows the significant changes occurring during recovery (Figure 1).

It can be seen that at longer time intervals, such as have been previously studied by various investigators, a slight increase in viscosity indicating the familiar phenomenon of recovery can be noticed. At very short time intervals, however, a very pronounced maximum of viscosity occurs followed by a drop at intermediate storage times. This phenomenon is particularly pronounced for short milling times. The longer the mastication the less pronounced this immediate and labile recovery seems to be, until at milling times of 30 minutes or more the effect has nearly disappeared.

This same change in recovery is also noticeable by studying with the ultra-microscope the morphology of films prepared from natural rubber. The effect of progressively increasing milling times can be seen in a finer and finer network formation until after 30 minutes of milling hardly any further changes can be detected (Figures 2, 3, 4). If milling is carried beyond 1 hour, the film becomes too weak to carry its own weight. As the threads in the network become finer, so do the globules, so that the structure of the rubber becomes more and more uniform. This can be considered as a visual proof of the equalization of the molecular weight fractions during mastication.

If the recovery phenomenon is studied in the ultramicroscope, the changes in viscosity with recovery are clearly reflected in the morphology of the rubber film. This is illustrated by Figures 5 and 7. Figure 2 shows smoked sheet which has been milled for 5 minutes and was not allowed to recover before observation. Figure 5 shows the same smoked sheet after 1 day of recovery,

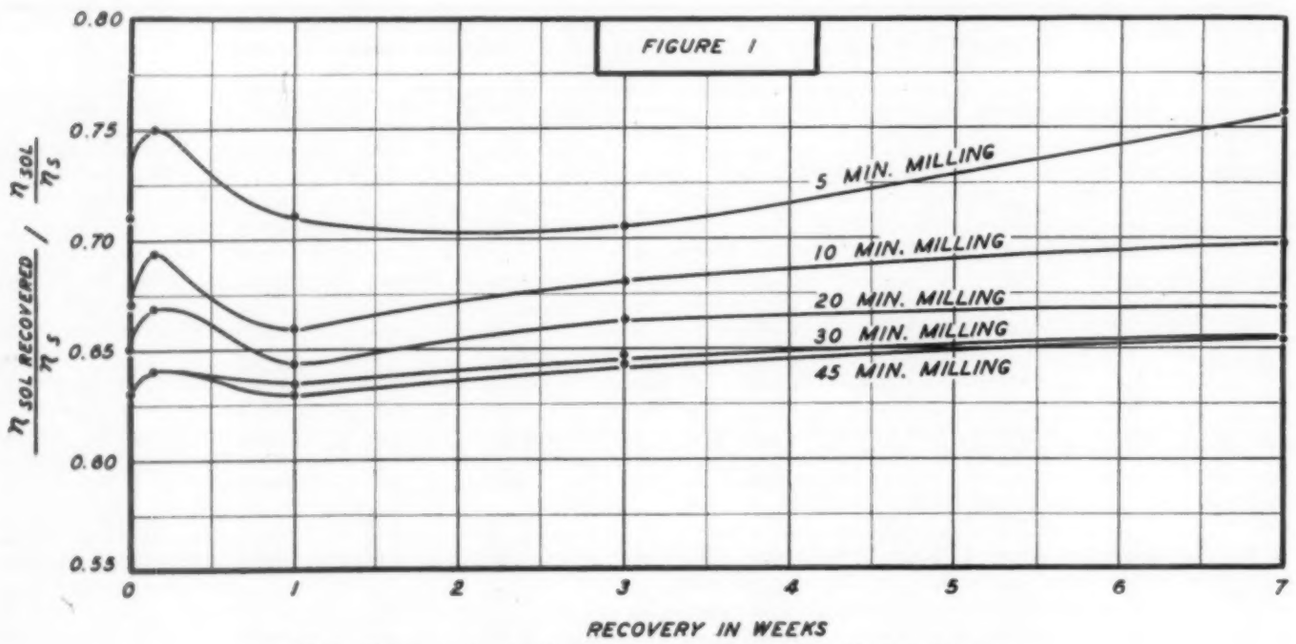


FIG. 1—Changes in the viscosity of solutions of milled rubber with time of storage.

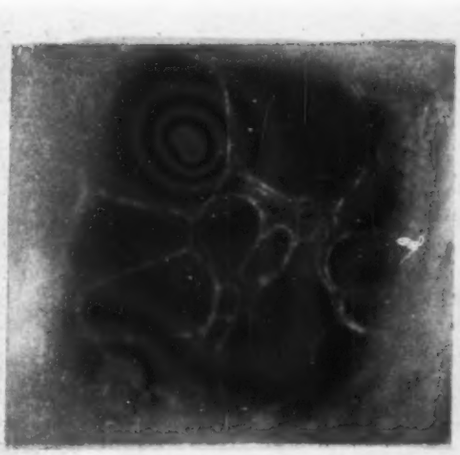


FIG. 2

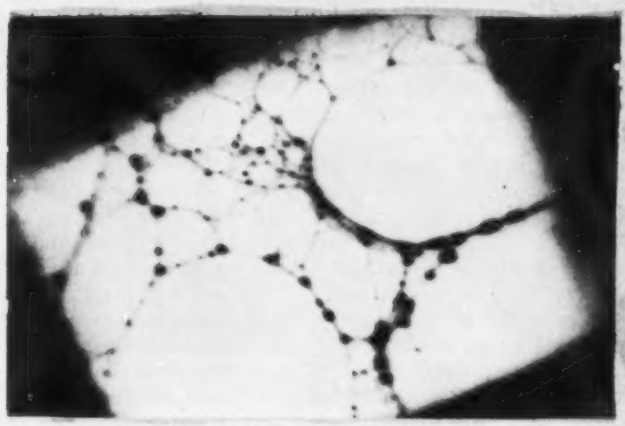


FIG. 3

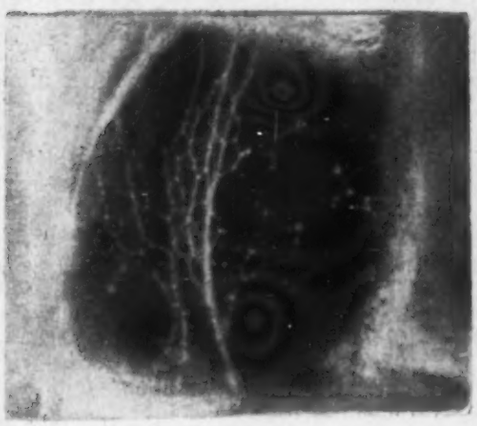


FIG. 4

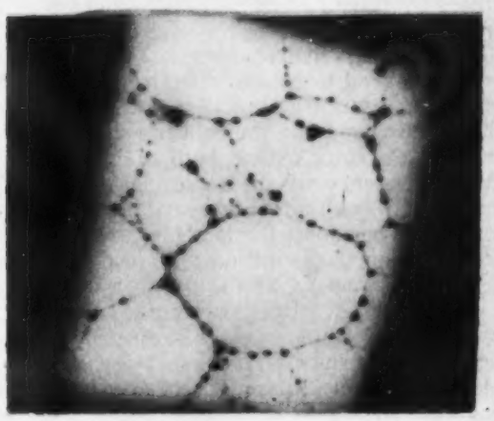


FIG. 5

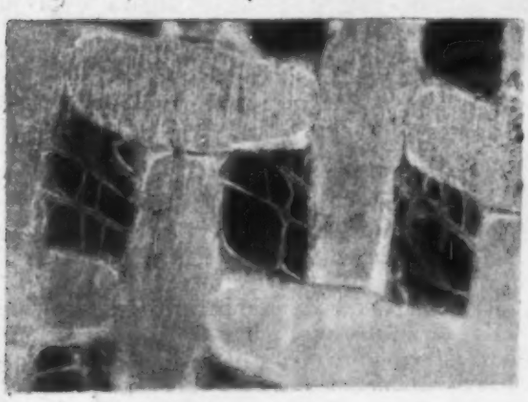


FIG. 6

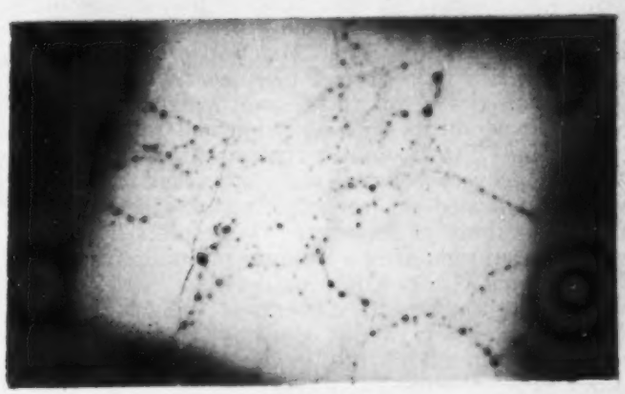


FIG. 7

FIG. 2—Smoked sheet, milled 5 minutes. FIG. 3—Smoked sheet, milled 20 minutes. FIG. 4—Smoked sheet, milled 30 minutes. FIG. 5—Smoked sheet, milled 5 minutes, stored 24 hours. FIG. 6—GR-S copolymer. FIG. 7—Smoked sheet, milled 5 minutes, stored 3 weeks. Note: Magnification of Figures 2, 3, 4, 5 and 7 is 3,000; Figure 6 is 1,000.

and Figure 7 after 3 weeks of recovery. The increase in viscosity after 1 day of recovery is clearly reflected in a coarser thread structure, whereas the dip in the viscosity after 3 weeks of recovery is reflected in a change of the structure to a very fine network. If milling is prolonged to 30 minutes, the network is so fine from the very beginning (see Figure 4) that little change can be observed with recovery. The viscosity-recovery curve of smoked sheet milled for 30 minutes also shows comparatively little change over the whole period of time of recovery under investigation.

Busse *(3)* has shown that the intensity of the Rus-

sell effect (*9*) varied with the type of rubber. Rubber which broke down less readily would show a smaller Russell effect than rubber which broke down very easily. Busse, however, did not investigate the change in intensity of the Russell effect with progressive mastication. During mastication, two major effects must be considered: The mechanical breakdown due to the shearing action of the mill rolls which also causes some distortion of the rubber molecules. However, this will not result in an actual scission of the individual rubber molecules. The other effect is the catalytic breakdown due to the action of oxygen in an activated state (possibly as peroxides). During short intervals of mastication, the mechanical breakdown will at first predominate and the amount of hydroperoxides formed will be comparatively small. Upon recovery, the rubber molecules will at first have a strong tendency to recover from the distortion sustained during milling, to slip back into certain preferential positions, and reaggregate to micelles. This will cause the effect described by Bary *(1)* as "gelation" and result in an increase in viscosity.

However, the hydroperoxides formed during mastication will tend to counteract this reaction. At longer periods of mastication, more and more hydroperoxides will have formed and the rubber will have been broken down to a greater extent, both of which will counteract the tendency of the molecules to reassume their preferential positions in regard to each other upon storage. Therefore, the labile recovery effect encountered for short mastication and recovery time will be the less pronounced as the time of mastication is increased. Finally after 30 minutes of milling, further changes in plasticity will be very small and peroxide formation will show no more increase. Busse (*3*) was able to detect the Russell effect even after 18 days of recovery. Thus it is understandable that actual recovery, as evidenced by a permanent increase in viscosity, will start only after the decomposition of these peroxides and will, of course, be more pronounced in rubber which has been milled only for a short period.

It is interesting to note that this effect of "labile recovery" has also been noticed to some extent in the physical properties of vulcanized compounds (*23*).

Similar experiments on mastication and subsequent press-heating (270°F.) of the rubber, varying the intervals of recovery between mastication and heating, have also indicated the reversible changes occurring during short times of recovery. If the press heating was carried out right after a 5 minute mastication, very little additional change could be detected in the viscosity of the solutions of rubber. If the same procedure, however, was carried out one day after mastication, a pronounced decrease in viscosity could be detected. This decrease was the greater the longer the press heating was carried out (heating times up to 45 minutes were investigated). If, however, the experiment was carried out one week after mastication, press heating did not cause as great a decrease in viscosity as after 1 day of recovery.

Again two effects will have to be considered, the effect of heat and the effect of the oxygen or peroxides present in the rubber due to previous mastication. Since all three experiments were carried out at the same press temperature and time intervals of heating, the effect of heat alone can be disregarded. It is logical to assume that the effect of press heating should be the same for rubber recovered for one day or for one week.

This brings up the time factor in the reaction of the hydroperoxides. Busse (*3*) and Farmer (*8, 9*) have proven the instability of these peroxides. Therefore, their effect should be greater right after their formation than after one week of recovery. This would explain the comparatively small effect encountered when press heating after one week of recovery. However, it will not explain the fact that the least effect on viscosity was encountered if the rubber was press heated right after mastication where the intensity of the peroxides should be the greatest, unless we assume the occurrence of a chain reaction, mentioned as a possibility by Busse for the long persistence of the peroxides. Such a chain reaction could go through a maximum and finally subside after a time between 1 to 3 weeks of recovery, whereupon actual and permanent recovery can set in.

Synthetic Rubbers

GR-S: 200 grams GR-S copolymer were subjected to milling at 115°F. The rest of the experimental procedure was the same as outlined for natural rubber. The milled samples were dissolved in benzene immediately after mastication and after 6 weeks of recovery at 25°C. Ultra-microscopic slides were prepared for various milling times. Figures 6, 8, and 9 show the changes occurring during mastication. In general it can be said that contrary to the smoothness of the natural rubber films, GR-S shows a rather ragged film formation, mostly consisting of broad bands. Actually no changes in the morphology of the polymer can be noticed with the time of mastication. Even prolonged mastication—60 minutes or more—will not result in any changes other than increasing the weakness of the film and threads until they finally cannot support their own weight. Globules (*11*), which are so characteristic for any kind of natural rubber, are generally not found at all, not even after prolonged milling. Recovery does not seem to change the picture to any great extent.

GR-S-10: Batch size, milling conditions, recovery and preparation of the samples were the same as discussed for GR-S. A considerable difference between the morphology of GR-S and GR-S-10 films can be noticed. Film formation is absolutely smooth (Figure 10); comparable to that of natural rubber, few globules occur (Figure 11). Progressive mastication produces finer threads, but in general the film is weaker and milling tends to weaken it quicker than GR-S. Again recovery does not seem to change the morphology. There are certain similarities between GR-S and GR-S-10 in the ultra microscope. However, if we consider the structure of the natural rubber polymer as a goal to be attained in synthetic rubber polymerization, then it should be said that according to the above observations GR-S-10 certainly seems to come closer to that goal than GR-S.

Neoprene GN: Again the size of the batch and conditions during milling as well as the preparation of the samples used for the ultra-microscopic observations were the same. However, due to the high specific gravity of neoprene, the mill gap had to be somewhat changed (0.020") to obtain proper milling. Figures 12 and 13 record the progressive changes occurring during mastication. Neoprene GN which has not been milled exhibits strong, smooth, netted bands, but no globules. After 5 minutes of milling, the first globules can be noticed, their number increasing as mastication

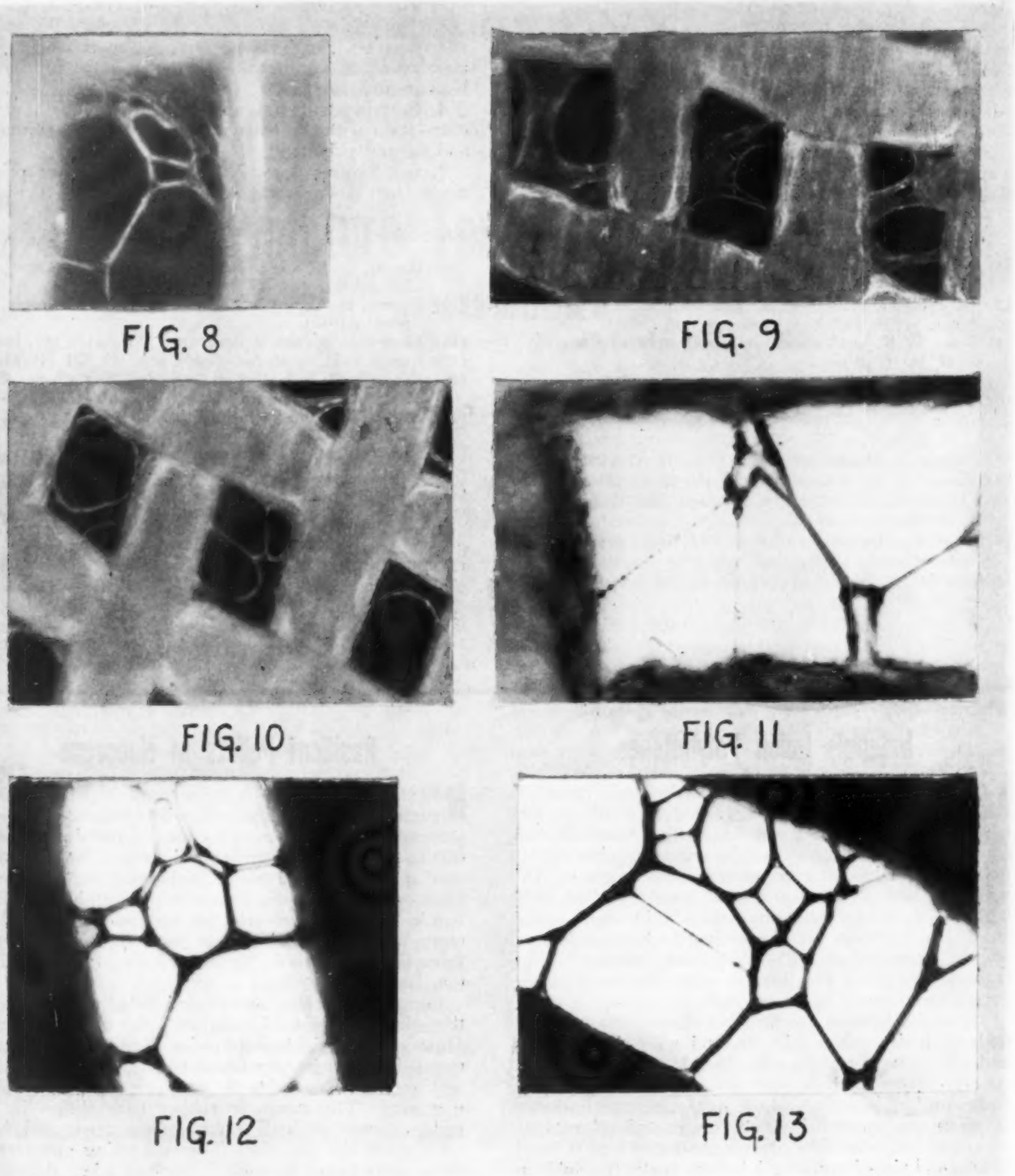


FIG. 8—GR-S Copolymer, milled 5 minutes (2000X). FIG. 9—GR-S copolymer, milled 30 minutes (1000X). FIG. 10—GR-S-10 copolymer (1000X). FIG. 11—GR-S-10 copolymer (3000X). FIG. 12—Neoprene GN (3000X). FIG. 13—Neoprene GN, milled 5 minutes (3000X). Note: Magnifications are indicated in parentheses.

progresses. At no time, however, do the droplets become as predominant as in natural rubber.

The capability of globules formation may very well be an indication of the structure of the molecules themselves. So far the two general groups of elastic, vulcanizable rubber polymers exhibiting globules either spontaneously or upon mastication are those which upon stretching will show x-ray fibre diagrams. The x-ray fibre diagram of neoprene is by far not as pronounced as that of natural rubber. Possibly the ease of globule formation is an indication of the ease with which polymer chains can slip by each other.

Summary

1. The structural changes resulting from mastication and subsequent recovery of natural rubber as determined by conventional physical and chemical methods were correlated with ultra-microscopic observations by incident light.

2. A tentative explanation is offered for the phenomenon of labile recovery occurring during very short periods of storage after mastication.

3. The progressive mastication of GR-S, GR-S-10 and Neoprene GN has been followed with the ultramicroscope. The differences in the morphology and mastication effects of these synthetic and natural rubbers are discussed.

4. Certain structural analogies are pointed out in correlation with the behavior of the various synthetic and natural polymers.

Note: Figures 3, 5, 7, 11, 12 and 13 are prints made from Kodachrome A slides (*13*).

LITERATURE REFERENCES

(1) Bary, P., and Fleurent, E., *Compt. rend.*, **184**, 947 (1927); **192**, 946 (1931).
(2) Bary, P., and Hauser, E. A., *Kautschuk*, **4**, 96 (1928).
(3) Busse, W. F., *Ind. Eng. Chem.*, **24**, 140 (1932).
(4) Busse, W. F., and Cunningham, E. N., *Rubber Chem. Tech.*, **12**, 163 (1939).
(5) Carson, C. M., *Ind. Eng. Chem.*, **23**, 691 (1931).
(6) Cotton, F. H., *Trans. Inst. Rub. Ind.*, **6**, 487 (1931).
(7) Davis, C. C., and Blake, J. T., "Chemistry & Technology of Rubber", p. 152, N.Y., 1937.
(8) Farmer, E. H., *Rubber Chem. Tech.*, **16**, 17 (1943).
(9) Farmer, E. H., *Rubber Chem. Tech.*, **16**, 45 (1943).
(10) Hachl, A., and le Bras, J., *Rubber Chem. Tech.*, **17**, 436 (1944).
(11) Hall, C., Hauser, E. A., et al, *Ind. Eng. Chem.*, **36**, 634 (1944).
(12) Hauser, E. A., and le Beau, D. S., *Ind. Eng. Chem.*, **37**, 786 (1945).
(13) Hauser, E. A., and le Beau, D. S., *J. Am. Chem. Soc.*, **68**, 153 (1946).
(14) Hauser, E. A., and le Beau, D. S., *Ind. Eng. Chem.*, **38**, 335 (1946).
(15) Hauser, E. A., and le Beau, D. S., *J. Phys. Chem.*, (in print) (1946).
(16) Hauser, E. A., and le Beau, D. S., *I.R.J.*, **110**, 169 (1946).
(17) Kemp, A. R., et al, *Ind. Eng. Chem.*, **19**, 531 (1927).
(18) Kemp, A. R., and Mueller, G. S., *Ind. Eng. Chem., Anal. Ed.*, **6**, 52 (1934).
(19) Neal, A. M., and Ottenhoff, P., *Rubber Chem. Tech.*, **17**, 875 (1944).
(20) Nunes, A.C.M., Bachelor of Science Thesis, M.I.T. (1946).
(21) Porritt, B. D., *Trans. Inst. Rub. Ind.*, **6**, 81 (1931).
(22) Pummerer, R., *Kautschuk*, **3**, 234 (1927).
(23) "Rubber: Physical and Chemical Properties," Research Association of British Rubber Manufacturers, p. 121, Croydon, 1935.
(24) Shacklock, C. W., *Trans. Inst. Rub. Ind.*, **6**, 259 (1930).
(25) Stamberger, P., and Blow, C. M., *Koll. Zeit.*, **53**, 90 (1930).
(26) Twiss, D. F., *I.R.J.*, **108**, 731 (1945); **109**, 14 (1945).
(27) White, L. M., et al, *Ind. Eng. Chem.*, **37**, 770 (1945).

Indopols Indoil Polybutenes

A SERIES of polybutenes under the trade name of the "Indopols" is currently being marketed by the Chemical Products Department of the Standard Oil Co. (Indiana), Chicago, Ill. The lowest member of the present series has an average molecular weight of 330 while the highest has a molecular weight of 940. Still higher molecular weight products may be made available. The Indopols are predominately high molecular weight monoolefins (85-98%), the balance being isoparaffins. They are light in color, are very stable even when exposed to air and light.

These polybutenes are miscible at room temperature with all hydrocarbon solvents, and with chlorohydrocarbons such as carbon tetrachloride, chloroform and trichlorethylene, ethers such as diethyl ether, esters such as n-butylacetate, and the like. They are insoluble at room temperature in such oxygenated solvents as ethyl alcohol, isopropyl alcohol, acetone, methyl ethyl ketone and glacial acetic acid, but are partially soluble in n-butyl alcohol.

The unusual characteristics of the Indopols result in many special industrial uses. They may be used as such in liquid electrical insulating systems or may be used to extend a variety of well known solid insulating materials such as solid polybutenes, Butyl rubber, GR-S, natural rubber, waxes and the like. They may be milled into polyethylene but show limited compatability. Adhesive compositions for use as such or on tapes, sheets, fabrics, gaskets or the like may be prepared from blends of compatible solid elastomers and resins with the Indopols.

Resilient Pellets of Neoprene

NEOPRENE is now being formulated with abrasive particles into tiny resilient pellets that act as grindstones to smooth the rough edges of metal stampings, castings, and precision-machined parts. The pellets are used in tumbling barrels for deburring parts made of brass, steel, or the light metals. A well-known California manufacturer selected neoprene after testing more than 100 combinations, according to a report from E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.

Composed of aluminum oxide bonded with neoprene, the pellets may be used in virtually any tumbling barrel. However, a special barrel lined with neoprene is recommended inasmuch as the neoprene lining resists abrasion and prevents damage to delicate parts in the tumbling operation. The synthetic rubber composition in the pellets serves as both a cushioning agent and as a matrix for the abrasive. The cushioning effect separates parts being finished, important when deburring items which have easily-damaged threads, serrations, or soft metal parts.

Neoprene also supplies a flexible backing for each particle of aluminum oxide, it was reported, insuring a constant even honing pressure as the abrasive removes burrs and sharp edges. The soft neoprene binder permits penetration into threads and serrations, bring the abrasive in contact with all surfaces. Examination of an actual operation shows that some of the neoprene pellets wear to small pieces which reach into deep recesses and small areas and remain useful until completely worn down.

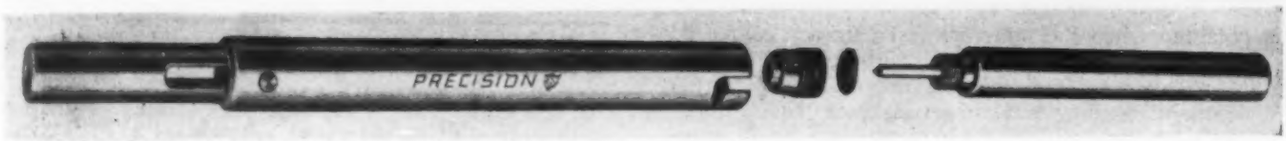


Figure 1.

A Puncture Tester for Rubber

By HAROLD M. LEEPER

University of Akron Government Laboratories, Akron, Ohio

AN INSTRUMENT, Figure 1, variously described as a puncture-tester,* a puncture-tear tester, and simply a tear tester for rubber and rubber-like materials has been examined at the Government Laboratories to determine what property or properties of rubber it tests, the best method of using the instrument, and the reproducibility of its results. It has been found that:

(1) Within the range examined, the instrument yields its least variable results when the puncturing mechanism is operating at 20 inches per minute and when the small disc samples are carefully gaged as to thickness at the probable point of rupture.

(2) The results obtained show no correlation with tear-test data; it is probably incorrect to refer to the instrument as a tear tester.

(3) Better correlation is obtained when the results are compared with tensile strength and modulus at 300% elongation.

(4) The uniformity of the results is reasonably good, the coefficient of variation of the test being approximately 3-5%.

The sample employed consists of a disc, ¾ of an inch in diameter, died out from a standard tensile test slab. A conical, 90°, hardened steel point is used as the puncturing tool and the sample is gripped on the periphery by two flanges, knurled to prevent slippage. The number of pounds of load on the indentor point required to cause the latter to puncture the specimen is recorded. The instrument is used in conjunction with the standard Scott Tensile Tester, the assembly being suspended from the upper clamp of the machine while the indentor point is brought to bear upon the sample at a constant rate of speed by attaching the indentor point to the lower clamp holding assembly. A more detailed description of the instrument has already been given by Bashore.

To determine the importance of gaging the samples even when they do not vary among themselves by more than a few thousandths of an inch in thickness, three series of tests were run on samples cut from three different stocks. The samples were accurately gaged but were all run at the same machine setting. The results of the tests were then corrected for the thickness of the specimens thus giving two sets of results, one corrected for thickness and the other uncorrected. The coefficients of variation of the uncorrected sets were then compared with those of the corrected sets. It can be seen from Table I that the latter are appreciably and consistently lower than the former. This indicates that the test is sensitive to small changes in the thickness of the specimens and that thickness should be accurately gaged.

Thirty samples were died out from one slab and were pulled in sets of ten at three different machine speeds. The results indicate that the optimum speed of the three tested is 21½ inches per minute. The normal speed for tensile testing is 20 inches per minute. It appears (Table II) the more slowly the indentor point is forced down on the rubber, the wider the variability in the results.

To determine whether the results of the puncture test correlate with those of tear tests or with any of the tensile properties of rubber, tensile slabs of the standard RRC test tread recipe prepared with GR-S X-55, X-125 and X-179, respectively, were cured for periods of 30, 45, 60, 90 and 150 minutes and the tests mentioned above were carried out on these. The results are given in Table III.

It can be seen from the data in Table III that the trend of the results of puncture tests shows little resemblance to that of the tear tests. Puncture resistance seems to be favored by overcuring while this is definitely deleterious to tear resistance. Better correlation

* H. H. Bashore, *India Rubber World*, Vol. 98, No. 2, p. 49 (May, 1938); *Rubber Chemistry & Technology*, Vol. 11, No. 4, p. 740 (Oct., 1938).

Note: The investigation on which this article is based was carried out under the sponsorship of the Office of Rubber Reserve, Reconstruction Finance Corporation, in connection with the Government's Synthetic Rubber Program.

TABLE I

Stock	*Coefficient of Variation* *Uncorrected*	*Corrected*
A	3.63%	2.46%
B	4.20%	3.80%
C	5.02%	3.96%

TABLE II

Machine Speed	*Avg. of Ten Specimens*	*Coefficient Of Variation*
2"/min.	600 lbs./inch	3.80%
13"/min.	717 lbs./inch	3.58%
21½"/min.	785 lbs./inch	2.55%

is obtained when the puncture test data are compared with modulus and tensile results although the data of Bashore seem to minimize the importance of tensile strength in deciding puncture resistance when rubber stocks of widely differing characters are being compared. There is a strong indication in Bashore's results that puncture resistance increases with increasing hardness.

Property of Cutting Resistance

Another property which, judging from the character of the test, is likely to be involved, is cutting resistance although data are not available to bear this out. The failure of the test to correlate with tear resistance might have been predicted because there is no initial cut in the specimen as there is in most tear tests and the character of the action at failure in the puncture test is definitely different from that in the tear test.

As to the practical significance of the test, it is difficult to theorize; the results of tests of this type are of necessity highly empirical and in the last analysis the user of the instrument must decide for himself its ability to evaluate that property of rubber in which he is interested, be it puncture resistance, cutting resistance or tear resistance.

A satisfactory method of using the instrument has been described here and assurance is given that if used in the recommended manner, the reproducibility of the test is satisfactory and considerably better than that of the tear test with which it has been identified.

TABLE III

Stock	Cure (Min.)	Puncture Test (lbs./in.)	M-300 (psi)	T.S. (psi)	Elong. (%)	ASTM Tear Test* (lbs./in.)
X-125	30	492	675	2291	680	31.2
	45	584	925	2775	625	32.1
	60	633	1205	2995	585	30.6
	90	679	1373	2830	505	28.9
	150	691	1565	2763	455	23.6
X-55	30	504	725	2360	660	25.8
	45	587	995	3050	635	33.3
	60	641	1250	3070	560	28.0
	90	768	1495	3030	500	26.2
	150	717	1735	2790	425	23.0
X-179	30	559	—	—	—	31.1
	45	604	—	—	—	33.7
	60	672	—	—	—	31.1
	90	723	—	—	—	23.7
	150	729	—	—	—	22.6

*ASTM D624-41T.

Kendex Thermoplastic Resins

KENDEX is the generic name used to designate a line of thermoplastic hydrocarbon resins currently being offered by the Specialty Sales Department of the Kendall Refining Co., Bradford, Penna. These products range from hard brittle substances to tough rubbery products with some of the characteristics of elastomers. The surface and feel may be waxy, tacky, or hard and mar-resistant. All of these products are characterized by their dark color which ranges from a brownish black to jet black. Some are claimed to be outstanding in the hydrocarbon resin field because of the relatively small variation in physical properties caused by temperature changes.

The Kendex Resins do not have exceptionally high molecular weights nor are they, in general, colloidal or gel type structures. Because the purity and nature of the raw materials employed in their production, unlike many hydrocarbon fractions, are subject to close control, the physical properties of the resulting resins can be made specific. For any given softening point up to about 300°F., the other physical characteristics can be controlled to yield a resin which may be hard and brittle, tough and rubbery, or any variation between these extremes.

The various Kendex resins offered by the Kendall Company show individual characteristics. For example, Kendex 5430 is a tough, rubber-like, resilient resin which found wide application in the war packaging program as a laminant for meeting the extremes found under service conditions. It was used in paper-to-paper or paper-to-foil work. The moisture vapor transmission rate is very low and the adhesive qualities, stability and electrical resistance properties are excellent. This resin may be used in food packaging as it is odorless. The outstanding property of this type of Kendex resin, however, is its very low susceptibility to consistency change with temperature. Kendex 5430 will remain soft and pliable at low temperatures (—20° to —40°F.). Generally, it will resist flow at the higher working temperature ranges (175—225°F.).

Many grades and types of Kendex resins are available to fit specific applications. Possible applications for these new resins cover many fields and industries. The tough rubbery types, such as Kendex 5430, are said to make excellent laminants, adhesives or binders where rough handling over a wide range of service temperatures will be encountered. Other possible applications include use as a rubber extender and plasticizer.

Coming Next Month

Over a period of years a large number of test methods have originated in the various laboratories of the Navy Department's Bureau of Ships. Starting with the next issue we will begin publication of a series of articles representing a compendium of these test methods, giving a brief description and indicating the originators of each of the methods. The series, prepared by Theodore A. Werkenthin, principal materials engineer of the Bureau of Ships, will cover adhesion type, thermal type, rheological type and chemical type tests, in addition to tests for light and weather resistance, diffusion, wear and abrasion, swelling and immersion, vibration and shock absorption, tear and cutting, and surface integrity. Over 90 illustrations will appear in connection with the series, as well as an extensive bibliography. The series will probably extend over five to six issues.—
EDITOR.

Editorials . . . . . .

Batt Report

THE report of the Inter-Agency Policy Committee on Rubber, issued on March 15, a condensation of which appears elsewhere in this issue, contains three major recommendations, as follows: (1) Production of 250,000 long tons of synthetic rubber a year, regardless of cost; (2) Maintenance of production facilities for an additional 350,000 tons; (3) Transfer of all production facilities, running and stand-by, to private ownership as soon as possible. These official recommendations closely follow those which have been repeatedly made by leading rubber executives, several of whom are members of the advisory body counselling the government on the over-all rubber situation.

It should be emphasized that the report, the first to be made by the special inter-agency committee, which includes representatives from the Army, Navy, Rubber Reserve, Rubber Development, Department of State, Department of Justice, Department of Commerce, and the War Assets Corp., is simply a statement of the general situation and of the basic issues regarding rubber, and makes broad recommendations of policy. It does not contain detailed recommendations concerning such factors as administrative measures to assure the use of synthetic rubber, disposal of the government-owned plants, or methods of continuing research and development. It is understood, however, that the committee is currently working on a supplementary report which will contain more down-to-earth recommendations, some of which will require legislative action before they can be accomplished.

It is quite evident that a minimum of 250,000 tons of synthetic rubber will be produced annually in the United States for security reasons, irrespective of gradually increasing receipts of natural rubber. As these columns have pointed out previously, production of synthetic rubber and consumption of that rubber are correlated. Therefore it is or should be equally evident that allocation of rubber supplies and control of specifications of end-products must be continued by the government. As imports of natural rubber reach respectable proportions the specifications can be eased to permit the use of greater amounts of the natural product in various types of rubber goods, but some form of control must be maintained for several long years to guarantee the consumption of at least 250,000 tons of GR-S.

The committee's report recognizes the value of continued research on the synthetics and urges that the government continue to maintain its own research activities and encourage private experiment. It is this research angle which will eventually tip the economical scales in favor of synthetic rubber or at least place it on a par with natural rubber, both as to properties and price. Vast strides have been made in compounding and processing. For example, at one time it was estimated that synthetic rubber took 30% more time to process than natural rubber; today that differential has been cut to about 5%. In addition, the search for new polymers continues and every month finds another group ready for further experimentation. The universal synthetic rubber may not appear for many years, but the birth of its first cousin is near.

Division Meeting

THE large attendance at the meeting of the Rubber Division, A.C.S., held in Atlantic City earlier this month fulfilled previous predictions and expectations. Approximately 1,000 members and guests attended the three-day meeting and it is estimated that some of the technical sessions attracted an attendance of over 1,200, the division membership being augmented by members of other divisions interested in rubber chemistry. Some criticism, however, concerning the nature of the papers presented was heard during the meeting. The charge was made that most of the papers were "academic" rather than "practical" and held little interest for the compounder. This charge has been levelled at some of the previous meetings as well. It might be a good idea for Division officers to encourage the presentation of "practical" rather than straight "theoretical" papers at future meetings.

INTER-AGENCY POLICY COMMITTEE ON RUBBER PROPOSES CONTINUED GOVERNMENTAL CONTROL

THE anxiously-awaited report of the Inter-Agency Policy Committee on Rubber, under the chairmanship of William L. Batt, which was named by Reconversion Director John W. Snyder last September to formulate proposals for a national rubber policy, was issued on March 17. In view of the shortage of natural rubber, which is expected to continue throughout this year and 1947, the report contains both short-run and long-run recommendations, including proposals that the synthetic rubber industry be turned over ultimately to private ownership, provided a definite minimum amount of synthetic rubber production can be assured in any future emergency; that the government continue its control of allocation of rubber to manufacturers and specifications of rubber products; that the government provide necessary controls to assure the domestic use of synthetic rubber to serve national security and interest; and that the government build up a stockpile of natural rubber.

Both short-run and long-term recommendations are made in the report, which emphasizes the fact that a logical short-run program must be based on the long-term policy. It also points out that during 1946 and probably through most of 1947, natural rubber will continue to be in short supply and therefore many of the long-term recommendations will be temporarily unnecessary or impossible to accomplish. Action taken in this temporary period, according to the Committee, should not be inconsistent with the long-range objectives of national rubber policy.

Short-Run Recommendations

For the period during which natural rubber continues in short supply, the following recommendations were made:

1. The synthetic rubber industry should, and will of necessity, continue to operate at a high level in order to supply the large demand for new rubber.

2. In order to distribute natural rubber supplies equitably throughout the world, international pooling and allocation of natural rubber should be continued.

3. Until ample supplies of natural rubber are assured, all but the least efficient synthetic rubber plants should be maintained in operation or stand-by condition.

4. Stocks of natural rubber in the United States should be increased in this early period in which new supplies are likely to be uncertain, so that adequate stocks will be available to support a somewhat higher rate of natural rubber consumption and to safeguard the national interest.

5. Government powers to allocate rubber to manufacturers and to control specifications of rubber products should be continued as long as the demand for natural rubber exceeds the supply. These powers expire on June 30, 1946, the present termination date of the Second War Powers Act. The powers of that act relating to rubber should therefore be extended.

6. Consistent with natural rubber receipts and the necessity for building up our inventory of natural rubber, the proportions of natural rubber permitted to be used in civilian products should be gradually increased.

7. Manufacturers should be allotted small amounts of natural rubber, for experimental purposes, since throughout the war little experimentation was possible to determine the most desirable proportions of natural and synthetic rubber to use in a given rubber article.

8. Until such time as private enterprise assumes the responsibility, the Government must of necessity continue to own and operate sufficient synthetic rubber capacity to meet the needs of the domestic economy. Except for facilities producing specialty rubbers, styrene and certain chemicals, as to which separate reference is made in other parts of this report, a detailed program for the transition from Government to private enterprise will be contained in a subsequent report.

9. The Government should continue to sponsor broad rubber research programs. It should also encourage private industry to undertake research with private funds.

10. Some form of national rubber supervision should be established in which all Government agencies having responsibility in the rubber field would be represented. This body should coordinate all governmental activities pertaining to rubber. It should also keep the rubber situation under continuous review in order to recommend to the President and the Congress desirable changes in the national rubber policy.

Long-Term Recommendations

Because there are so many changing factors in the rubber situation that the national rubber policy must be constantly reviewed and because present statistics furnish only a tentative guide to future supply and demand potentials, the report included the following long-range recommendations:

1. There should be continuously maintained in production and use, regardless of cost, sufficient synthetic rubber capacity to meet at least one-third of our rubber requirements, exclusive of requirements for special-purpose rubbers. This involves a minimum consumption of general-purpose synthetic rubber in the neighborhood of 250,000 long tons per year. The plants maintained in production should comprise the most efficient and low-cost of existing facilities. Consequently, the inclusion of plants using alcohol as a raw material is not now indicated.

2. The Committee's recommendation as to the best method of assuring a minimum use of synthetic rubber will be submitted in a supplemental report. The necessary legislation should be based on a policy of minimum Government interference and of maximum scope for private enterprise.

3. Private ownership and operation of the synthetic rubber industry should be a major objective. The Committee feels that this will provide an important contribution to research and development. In the interest of developing competitive conditions in the synthetic rubber industry, it is desirable that the amount of production capacity in private hands should exceed that of guaranteed use.

4. Such efficient general-purpose synthetic rubber plants as are in excess of those required for the minimum program should, if not acquired by private industry and available for the production of synthetic rubber, be maintained by the Government in adequate stand-by condition. After natural rubber is in ample supply and as long as they are owned by the Government, these plants should not be operated except in a national rubber emergency. In order to avoid complete reliance upon petroleum as a raw material, at least one plant using alcohol feedstocks should be in-

cluded in the capacity maintained in adequate stand-by condition. The total of general-purpose synthetic rubber plants in operation or stand-by would approach about 600,000 long tons yearly capacity in the light of present estimates. This is about 60 per cent of our presently existing capacity.

5. Broad research programs for quality and cost improvements in the synthetic rubber field should be continued by Government and private industry. The Department of Agriculture should continue experiments with the cultivation and processing of botanic sources of natural rubber capable of being cultivated in the United States and tropical America.

6. The Government should accumulate and maintain a strategic stockpile of natural rubber. This stockpile should be held wholly apart from stocks in commercial channels and, except for rotation requirements, should be retained for rubber emergency use exclusively.

7. With the certain prospects of a changing rubber situation, continuous review of the problem should be maintained.

Security Conditions Paramount

Plant disposal, the committee urges, "must be consistent with the objectives of the national interest." Some types of synthetic rubber plants could be divorced from the present programs and sold forthwith, it was believed, and among these were listed the butyl, neoprene, styrene and certain of the specialty chemical plants. Others, including the butadiene and copolymerization plants, should be retained by the government "until methods have been perfected for assuring through private operation the adequate minimum production of general-purpose synthetic rubber."

According to the report, security considerations demand that in the future one ton of domestically produced general-purpose synthetic rubber must be used for every two tons of natural rubber. Synthetic rubber consumption in this over-all proportion should be made mandatory in postwar years if sufficient voluntary uses do not sustain "security" production levels. The Inter-Agency Committee estimates that the 1-to-2 synthetic-natural rubber consumption ratio will require minimum domestic production of some 250,000 long tons of general-purpose synthetic rubber. Imports of natural rubber would be approximately at prewar levels. Government allocation and specification control, regulating the distribution and proportions of synthetic to natural rubber for specific uses, would be continued for at least six months after natural rubber is again in ample supply.

The report contemplates that natural rubber will eventually enjoy a substantial price differential over general purpose synthetic rubber, although the present price of GR-S is 18½c a pound against a government natural rubber selling price of 22½c. Since the present synthetic rubber price allows for higher production costs, elimination of the most uneconomic production would mean that the consumer may be able to get this rubber at 15 to 16c per pound. No estimates are made of future natural rubber prices.

The United States would maintain about 60 per cent of present synthetic rubber capacity either in operation or stand-by condition, under the policies called for in the report. This would assure at all times access to plants yielding some 600,000 long tons. In addition, the government would accumulate and maintain a strategic stockpile of natural rubber. This stockpile should be held for rubber emergency use exclusively. However, it is urged that manufacturers should be allotted small amounts of natural rubber for experimental purposes, since little experimentation was possible during the war to determine the most desirable proportions of natural and synthetic rubber to use in a given rubber article.

Subordination of Cost

The subordination of cost considerations is stressed in the committee's report, although it is said that, within the framework of security considerations, rubber policy should be shaped to involve a minimum of cost both to the United States Treasury and to consumers of rubber goods. But the committee adopts the fundamental proposition that sufficient synthetic rubber must be produced and used to protect the national interest of the United States regardless of cost. Government and private industry are urged, however, to continue broad research programs for quality and cost improvements in the synthetic rubber field. The Department of Agriculture is urged to continue experiments with the cultivation and processing of botanic sources of natural rubber capable of being cultivated in the United States and tropical America.

The committee gives recognition to the effect which United States rubber policy will have upon the economies of foreign countries, particularly large rubber producing countries. While the committee notes that the existence of a minimum domestic synthetic industry will assure users in this country a dependable domestic supply and "tend to establish a limit on all rubber prices," it adds this note of caution on foreign policy: "At the same time, if the domestic synthetic industry should attain such a size as greatly to reduce imports of natural rubber and hinder exports of goods in exchange, then the loss in potential business would tend to offset the beneficial effects which a domestic industry might have."

While the committee left to later recommendations what steps might be needed to assure minimum synthetic rubber use, the long period for which it contemplated the retention of specification controls suggested that some method along this line might be advocated. The fact that many products made wholly of synthetic are not yet the equal of articles with varying percentages of natural rubber was noted by the committee, in suggesting that voluntary consumption of synthetic rubber might not meet the desired levels. The committee also noted that price considerations might deter voluntary synthetic uses, since it is likely, when natural rubber comes into ample supply, that the present synthetic rubber price advantage may be lost.

Supply and Demand

The committee gave the following picture of the potential rubber supply and demand outlook: After rehabilitation of Far Eastern plantations, the total synthetic and natural rubber annual productive capacity of 3,000,000 long tons would compare with world consumption probably not exceeding 1,500,000 tons. The United States would require a maximum of 900,000 tons annually. The present synthetic rubber capacity was said to exceed 1,400,000 long tons, with the United States the greatest producer, but Canada and Russia also producing very appreciable amounts.

For the short-run picture it was said that as much as 600,000 tons of natural rubber may become available in all consuming countries during 1946 and 900,000 tons in 1947. To distribute natural rubber supplies equitably throughout the world, the committee proposed the continuation of international pooling and allocation of natural rubber. Total rubber consumption in the United States for 1946 and 1947 has been estimated at 903,000 and 875,000 tons, respectively. However, it was pointed out that various uncertainties including disturbed political conditions in the Far East, render the natural rubber supply picture uncertain; hence, the short-run estimates are by no means assured.

Of postwar yearly rubber consumption estimated for this country, 750,000 tons would represent needs for other than specialty types. It is this figure which would be subject to the 2 to 1 ratio of natural to synthetic. The committee said it did not intend that producers of general-purpose synthetic rubber should be "guaranteed" a market of 250,000 tons irrespective of future changes in total national demand for new rubber, but that the figure is an indication of the possible amount involved in assurance of the desirable ratio.

Present estimates were said to call for production for domestic use of some 600,000 long tons of general purpose synthetic rubber in 1946, and 350,000 to 400,000 in 1947. This would be sufficient requirement to keep all of the more efficient plants in operation, it was said. The remaining, other than a few for which no further need existed, should be kept in stand-by condition for use in case natural rubber imports failed to reach anticipated levels.

While the committee urged transfer of the synthetic rubber industry to private ownership at the earliest practical time, it noted the present high degree of integration of butadiene and copolymerization plants and the advantages stemming from this, and deferred until a later report recommendations for disposal of these plants.

In order to achieve a continuously coherent national rubber policy, the committee strongly recommended the creation of a national rubber supervisory authority, with a rubber director appointed by the President as chairman. This body might comprise a committee composed of representatives of those government agencies which have particular interest or responsibility in the rubber program. Until establishment of this authority, however, it was proposed that the present functions be continued by the CPA Rubber Division and the inter-agency group.

AMENDMENT TO RUBBER ORDER INCREASES USE OF NATURAL RUBBER

Under the revised terms of Appendix II of Rubber Order R-1, issued on March 26, an increase of 5,500 long tons monthly is permitted in the consumption of natural rubber. The increase, which will not affect passenger car tires but will go largely into truck and bus tubes and into inner tubes for medium and large truck tires, represents a gain of approximately 50 per cent. It reflects increased shipments of rubber from the Far East.

The latest amendment to Appendix II permits the use of natural rubber instead of Butyl in inner tubes for truck tires of 8.25-inch cross section and larger. Because of the heavy demand for Butyl, the use of natural rubber for inner tubes of this size is expected to be made mandatory in the near future.

The amount of natural rubber permitted in small truck, bus and city mileage tires (7.00 cross section and under, 6 and 8 ply) remains unchanged at 13% but the percentage of such rubber allowed in the popular "air-wheel" small truck tire (7.50-16, 6 and 8 ply) is increased from 13 to 33%. In other small truck tires in the 7.50 and 7.00 sizes, the increase is from 13 to 23%.

Small bus tires (7.50 and under) may now include 67% of natural rubber as compared with the 33% previously allowed, while the medium and large truck and bus tires which previously were limited to 33% of natural rubber may now use up to 67% and all larger bus tires may be made with 94% of natural rubber.

The amended order also allows additional natural rubber for special-purpose tires. For example, large earthmover, rock service, logger and off-the-road tires may be made with as much as 94% natural rubber in some sizes. All types and sizes of highway solid tires formerly made with GR-S may now be made from natural rubber. Manufacturers may also use natural rubber "as required" in airplane inner tubes.

As a result of the amended appendix, the percentage of natural rubber to total new rubber consumption in the United States will rise from about 15% to 20%. Incidentally, the highest rubber consumption rate since controls were imposed in July, 1941, was registered by the rubber manufacturing industry in January of this year when it used a total of 99,149 long tons of natural, synthetic and reclaimed rubber. This was the second highest rubber use rate in the history of the industry, exceeded only by the 108,919 tons used in June, 1941, prior to the imposition of control.

Textile Situation Serious

In the meantime, according to a report by the Rubber Manufacturers Association issued on April 3, widespread curtailment of production is currently confronting the entire rubber manufacturing industry. Scarcity in fabrics is so acute that departments in some plants are reported to be already idle while wide scale shutdowns for want of textile materials are threatening tires, mechanical goods, coated materials and rubber footwear within the next few weeks.

The most acute shortages are said to be in twelve classes of material, including hose and belting duck, enameling duck, chafers, tire cords, yarns, osnaburgs, sheeting, print cloths, sateens and drills and twills. Extreme difficulty is being encountered in obtaining any of these materials in the gray. Tire manufacturers have been hardest hit by the shortage in enameling duck, chafer fabric, osnaburgs and sheetings. Other type manufacturers are in equally difficult straits with belt and hose duck and hose yarns especially tight.

Textile mill operators had led the rubber manufacturing industry to believe, reports the R.M.A., that when the scarcities developed last December, increased prices were needed to move their goods. OPA allowed general price increases on fabrics on March 8 on most critical constructions required by the rubber industry but thus far these increases have failed to result in increased shipments.

Hope for some relief lies in recent amendments by the Civilian Production Administration to Orders M-317 and M-317A. These amendments reinstate channeling controls over industrial cotton fabrics which had been lifted shortly after V-J Day. Under the new regulations producers of certain type cotton fabrics, including hose and belting duck, enameling duck, chafer fabrics, osnaburgs, coarse and medium sheetings, drills and twills, and sateens, will set aside a proportion of their second quarter output to meet vital industrial and agricultural requirements.

The set-asides pro-rated to the proportionate demand for the individual constructions range from 7½% for certain Class B sheetings to 100% for chafer fabrics, hose and belting duck and filter duck. A total of 228,000,000 yards of cotton fabric or 9.5% of the estimated second quarter output will be reserved for industrial and agricultural requirements other than bags. Export set-asides are substantially the same as those which have been in effect for some time.

In general the amendments to the textile orders are expected to result in some easing of the critically tight supplies of broad woven fabrics. The extent to which they will reflect shortages of fabrics utilized by the rubber manufacturing industry depends upon the speed with which the textile mills are able to comply with the provisions of the amendments.

Extend British Agreement

According to a statement issued by the U. S. Department of State on April 3, the agreement under which the Rubber Development Corporation is buying natural rubber from Malaya at a price of 20¼c per pound for standard top grades delivered f.o.b. on sea-going steamers at Far Eastern ports has been extended through June 30, 1946. The previous agreement applied to deliveries from V-J Day through March 31 only. Similar price arrangements are in force with the governments of France and the Netherlands.

Considerable antagonism is being experienced in London both over the original agreement under which the British are supplying rubber to the United States at the 20¼c figure and particularly to the extension of that agreement. Criticism concerning the agreement has been voiced loud and often in Parliament in the past several weeks with one charge accusing the British Government of selling Malayan rubber producers "down the river." Another accusation made was that Britain is sacrificing a valuable source of dollar exchange.

In the meantime substantial shipments of natural rubber from the Far East, particularly from French Indo-China, are arriving in the United States. Some 20,000 bales of rubber have also arrived recently from Brazil. All of this rubber is, of course, consigned to the Rubber Development Corporation in accordance with existing agreements.

Prices have been established on certain African rubbers and inferior types of Ceylon rubbers by the Office of Rubber Reserve. These prices are as follows: African Wild Rubber (direct shipments), 11¼c per pound; Ceylon Scrap (shipped from United Kingdom), 14⅛c per pound; MS-8 Ceylon Low Bark Crepe, 17c per pound; MS-9 Ceylon Inferior

Scrap Crepe, 12c per pound; Domestically washed and dried high quality African Rubber, 19⅝c per pound.

A price of 10½c per pound has also been established on the accumulated inventory of African Rubber received from the United Kingdom or the Union of South Africa. The stock of African rubber on hand is being reduced rapidly and present indications are that no additional quantities will be allocated to the United States. In addition, Ceylon rubber is expected to revert to universal types (RMA) shortly.

Some New Price Regulations

Amendments to pricing regulations on various types of rubber products issued in recent weeks by OPA included the following:

Certain Commodities: Existing provisions for determining industry-wide ceiling price increases for specified reconversion products may be used for such products, according to Amendment No. 26 to M.P.R. 220 (Certain Rubber Commodities), effective March 21. The extension applies to rubber items covered in the regulation whose 1944 production was one-half or less of the last representative period of peacetime production, the production loss being due to government restrictions or from use of the manufacturing facilities for other war goods. The items actually covered represent a small number, such as bathing caps, that have been largely in part or wholly out of production since 1941. Incidentally, retail ceiling prices for full head-shaped molded bathing caps of natural or synthetic rubber have been established in Order 117 under M.P.R. 220.

Mechanical Goods: Maximum list prices for rubber flooring other than neoprene flooring have been established in Amendment No. 25 to M.P.R. 149 (Mechanical Rubber Goods), issued March 27 and effective April 1. Maximum prices for manufacturers' sales of friction tape and splicing compound were set in Amendment No. 26 to the same regulation, issued April 3.

Tires and Tubes: According to Amendment No. 5 to R.M.P.R. 119 (Original Equipment Tires and Tubes), issued on March 7, maximum prices for sales of original equipment tires and tubes by persons other than manufacturers or brand owners shall be determined pursuant to the provisions of Section 4 of R.M.P.R. 143, notwithstanding any other provision of R.M.P.R. 119.

Miscellaneous: Retail ceiling prices for men's new black rubber half heels declared surplus by the armed forces are set in Order 110 under S.O. 94; maximum retail prices for new industrial pressed-on solid tires made of neoprene by Firestone are contained in Order 90 under R.M.P.R. 528; prices have been established for certain logger, earthmover and rock grip excavator tires made by Firestone in Order 100 under R.M.P.R. 528; a method of determining maximum manufacturers' prices for the sale of rubber braid building wires is contained in Amendment No. 2 to M.P.R. 82; maximum retail prices for certain sizes of new truck and bus tires and tubes made by Goodyear are set in Order 91 under R.M.P.R. 528.

Purchases Natrium Plant

The large chlorine and caustic soda producing plant at Natrium, W. Va., operated by the Columbia Chemical Division of the Pittsburgh Plate Glass Co., has been purchased by the company from the government. The plant consists of six principal buildings, including a chlorine manufacturing building, machine shop, power house, caustic manufacturing building, administration building, and a combination employment office and gate house. Situated on the Ohio River approximately 30 miles south of Wheeling, the Natrium plant first went into production in July, 1943. It is one of the largest chlorine producing plants ever built as a single unit east of the Mississippi River. Salt brine at the plant is pumped from wells more than 6,000 feet deep.

Seiberling Issue Approved

Stockholders of the Seiberling Rubber Co., Akron, voted on February 27 to approve the company's contemplated $3,500,000 new prior preferred issue, with holders of both Class A preferred and common stocks voting.

Plastolein X-348 Plasticizer

Emery Industries, Inc., Cincinnati, Ohio, has developed Plastolein X-348, a primary plasticizer for butadiene-acrylonitrile synthetic rubbers. An advantage of the new plasticizer is said to be its aging characteristics. In typical stocks containing X-348, it is reported that 60 per cent of the initial ultimate elongation is retained after 70 hours at 250° F. Although mixtures containing X-348 are low in heat loss and exhibit low composition set, they are said to be high in tensile strength, elasticity and recovery.

Form Pancorbo Span Corporation

Formation of the Pancorbo Span Corporation, with headquarters at 1600 Walnut St., Philadelphia 3, Penna., has been announced by Miss R. Pancorbo, daughter of the late M. Pancorbo, of New York. Miss Pancorbo is president of the new organization which will continue the manufacture and distribution of the Span Grinder, the grinding mill for producing ground rubber scrap. The Pancorbo Span Corp. will also continue to furnish replacement knives and parts for the grinder.

Announces Three Developments

The Naugatuck Chemical Division of the U. S. Rubber Co. has announced the following developments which were evolved from research on synthetic resins: a non-chipping, non-yellowing plastic enamel for refrigerators and kitchen appliances; a textile treatment to give fabrics a permanent "starch;" and a moisture-proof coating for packaging and for shipping machine parts. Completely invisible on the fabric and unaffected by laundering, the new textile treatment is said to give fabrics a permanent "starchiness" under all weather conditions. Reported advantages of the new plastic coating, called Kotol, are low moisture-vapor transmission, good elongation and toughness as illustrated by its tensile strength of 900 pounds per square inch. The coating has a wide temperature range with flexibility at —40° F. and good aging characteristics at 180° F. The coating is applied by spraying or dipping and is then dried, either by air or baking at 250° F.

Hewitt Rubber Promotes Three

Hewitt Rubber Corp., Buffalo 5, N. Y., has announced three new executive appointments in its production and sales department. F. C. Travers, formerly with the Gates Rubber Co., Denver, Colo., has been named manager of the molded products division, and Robert A. Nilson, previously production superintendent of the Latex Foam Division of U. S. Rubber Co., Mishawaka, Ind., has been appointed production superintendent of "Restfoam," the company's foam rubber. L. C. Holloman, formerly of the company's production department, has been appointed to the sales staff in charge of "Restfoam."

Newth Plant Under Construction

A modern one-story factory building of concrete and steel is under construction for the Newth Rubber Co. on the site of the company's plant in Barrington, R. I., which was destroyed by fire last November. Machinery used in the manufacture of rubber products which was damaged by the fire, has been repaired and will be ready for installation in the new building when it is completed in about two months. The company has filled orders for the past few months by having its work done at the Kleistone Rubber Co., in Warren, R. I., and other nearby rubber factories.

Common Stock Increase

Norwalk Tire & Rubber Co. called a special meeting of stockholders on April 12 to consider an increase in outstanding common stock of 65,000 to 75,000 shares. The purpose of the increase is to provide for repayment of bank loans used to retire 7 per cent preferred stock, which was called for redemption on April 1, and to increase plant facilities.

RUBBER DIVISION HOLDS SUCCESSFUL MEETING AT ATLANTIC CITY

Approximately 1,000 members and guests attended the three-day meeting of the Division of Rubber Chemistry, A.C.S., held in Atlantic City, N. J., on April 10, 11 and 12. The meeting, held in conjunction with the 109th meeting of the parent society, was the first to be held by the Rubber Division since the Spring of 1944, the latter meeting having been held at the Hotel Commodore in New York City. The meeting in Atlantic City featured the presentation of 37 technical papers, many on subjects held confidential during the war period, presentation of the Charles Goodyear Lecture, a business session, and the usual, well-attended banquet.

The technical sessions got under way promptly at 1:30 P.M. on Wednesday afternoon, April 10. In his introductory address of welcome, Dr. W. A. Gibbons, Development Director of the U. S. Rubber Co., and Chairman of the Division, made reference to the fact that the meeting was the first to be held in two years. He briefly reviewed the contributions to the war effort by rubber chemists in general during the past few years, particularly with regard to the specific development of military products. He also referred to the good job done by the rubber industry in converting from natural to synthetic rubber.

All of the 37 scheduled papers, including the Charles Goodyear Lecture, were presented during five separate technical sessions. All of the sessions were held in the giant Convention Hall on the Atlantic City Boardwalk, and facilities were quite good. Abstracts of all of these papers were published in the March, 1946, issue of RUBBER AGE. Headquarters for the Division were maintained at the Hotel Ambassador.

Charles Goodyear Lecture

The Charles Goodyear Lecturer was Dr. Waldo L. Semon, director of pioneering research of the B. F. Goodrich Co. Selected as the Lecturer for 1944, the 1946 meeting was the first opportunity for Dr. Semon to deliver his talk. In introducing Dr. Semon at the technical session held on Thursday morning, April 11, Dr. Gibbons pointed out that he was the third chemist to be so honored by the Rubber Division, Dr. L. B. Sebrell having been the first and Dr. David Spence the second.

Dr. Semon selected "Research Leading to Commercial Butadiene Synthetic Rubber" as the title of his lecture. He reviewed the chemistry of the butadiene rubbers from early investigation through recent patents, and gave due credit to American ingenuity in meeting the rubber crisis during the war, citing the fact that the 830,000 long tons of GR-S produced last year was more than the nation had ever used of natural rubber in any similar period, this amount being the equivalent of 169,000,000 passenger car tires.

Dr. Semon emphasized three points in his talk, these being: (1) Actual productive capacity of every plant in the government's wartime rubber program exceeded its designed capacity; (2) Production costs were lower than had been estimated, and have been continually decreasing; (3) Passenger car tires better than the best prewar tires are already being made 100 percent from GR-S.

In addition to the papers presented at the several technical sessions held by the Rubber Division, papers of interest to rubber chemists and technologists were also presented before other divisions of the Society. Of special interest was a High Polymer Forum presented on April 9 and 10 under the sponsorship of the Division of Paint, Varnish and Plastics Chemistry, in cooperation with five other divisions, including the Rubber Division. The Forum featured 16 papers, all of which were listed in our previous issue. Abstracts of some of these papers, as well as of some papers delivered before other divisions, will be published in our next issue.

Business Meeting Held

The Business Meeting of the Rubber Division was held on Friday morning, April 11. Reports were made by several committees, as follows:

Nominating Committee: Dr. John T. Blake (Simplex Wire) offered the following slate of nominees for 1947, all to be selected by letter ballot: *Chairman,* W. W. Vogt (Goodyear); *Vice-Chairman,* Harry E. Outcault (St. Joseph Lead), R. A. Schatzel (Rome Cable); *Treasurer,* C. W. Christensen (Monsanto); *Secretary,* Charles R. Haynes (Binney & Smith); *Sergeant-at-Arms,* C. R. Cuthbertson (U. S. Rubber), L. M. Baker (Mansfield Tire); *Directors* (3 to be selected), George Allison (Goodrich), F. W. Frerichs (Cupples), Norman Grace (Dunlop), S. D. Gehman (Goodyear), Walter Geldard (Naugatuck Chemical), Arthur M. Neal (DuPont), Gilbert Swart (General Tire).

Membership Committee: Harry E. Outcault (St. Joseph Lead), chairman, reported that since its appointment in 1944 the present committee had secured 265 new members, including 37 associate members, and 42 new members for the parent society. He also stated that as of April 1, 1946, total membership of the Rubber Division amounted to 1,536, including 1,271 full members, 257 associate members, and 8 honorary members. In addition, there were 299 subscription members to *Rubber Chemistry & Technology.* This record was achieved in face of the fact that for a period of time, due to the paper shortage, new members were not able to secure copies of *Rubber Chemistry & Technology.*

Bibliography Committee: Dr. John McGavack (U. S. Rubber), chairman, reported that the "Bibliography of Rubber Literature for 1940-41," sponsored by the Division, would be available for distribution in the next several weeks. He also reported that advertising income, plus the sale of additional copies, will assure the Division a profit of approximately $3,000 on the 1940-41 edition. A copy of the edition will be supplied without cost to each member of the Division.

In addition to the above committee reports, Dr. H. I. Cramer (Sharples Chemicals), secretary of the Division, reported that the Fall Meeting of the Division will be held in Chicago in conjunction with the 110th meeting of the parent society providing suitable hotel accommodations can be arranged. In the event that no such accommodations can be provided the Division will hold a meeting of its own, probably in Cleveland.

Dr. Cramer also revealed that the revised by-laws of the Division had been overwhelmingly approved by letter ballot and were now in effect pending final acceptance by the parent society. The new by-laws contain two important changes: (1) They provide for official sponsorship by the Division of local rubber groups expressing desire for such sponsorship; (2) They change the previous Charles Goodyear Lecture to a Charles Goodyear Medal, and provide suitable ceremonies and awards in conjunction with the selection of the Medalist.

Announcement of the retirement of Dr. Cramer as secretary of the Division was made at the business session. Dr. Cramer, who has handled the secretarial duties for many years, finds the pressure of his present duties too great to continue in that capacity for the Division, and his resignation was accepted with great regret. As noted above, Charles R. Haynes (Binney & Smith) was proposed by the Nominating Committee to occupy the position of secretary, replacing Dr. Cramer. In view of this situation, it was moved, seconded and approved that Mr. Haynes be elected assistant secretary of the Division for the balance of the current year.

Banquet Draws Usual Crowd

The banquet of the Rubber Division, always one of the highlights of the meeting, was held on Thursday evening, April 10, in the main ballroom of the Hotel Chelsea, with approximately 825 in attendance. Two honored guests were Bradley Dewey, president of the Dewey & Almy Chemical Co., and present chairman of the parent society, and Charles Parsons, who recently retired as business manager of the society after having served since its inception. Mr. Dewey delivered a brief address, largely on the humorous side. The usual excellent entertainment, featuring a number of variety acts, was presented.

Special thanks are due to the committee in charge of arrangements for the Atlantic City Meeting. This committee was headed by Harry Bimmerman (Du Pont) and included Sam Martin (Thiokol), William H. Ayscue (DuPont), Larry Youse (Gilmer), and Wm. B. Dunlap, Jr. (Lee Tire).

PRODUCTION OF CASINGS INCREASED IN JANUARY

Production of automotive pneumatic casings by American manufacturers in January amounted to 5,972,790 units, an increase of 23.9% over the previous month, while shipments in January amounted to 5,537,154 units, an increase of 28.9%, according to the latest statistical report of the Rubber Manufacturers Association. Passenger casing production totaled 4,705,092 units in January, an increase of 24.1%, while production of truck and bus casings totaled 1,267,698 units, an increase of 23.5% to approximately the December level. Output of passenger, truck and bus tubes (4,639,762) showed an increase of 17.2% over the 3,958,851 units produced in December.

While production of automotive casings climbed to 5,972,790 units in January, the R.M.A. warned, in a statement accompanying the report, that textile shortages seriously threaten to wipe out the tire industry's production gains for the first quarter of 1946, and carry further into next year the day when civilian tires will again be available in normal supply.

Some tire manufacturers were reported already threatened with curtailment of production for want of fabrics. Others, with only a small portion of the second quarter requirements in tire fabrics assured, foresee shutdowns by May 1 unless supplies of enameling duck, chafers, Osnaburgs and sheetings are materially eased.

In line with increased production, January shipments of passenger casings were 4,380,997 units, up 27.3% over December, and shipments of truck and bus casings were 1,156,157 units, up 35.4%. Tube shipments increased 17.9% over the 3,635,702 units shipped in December.

Manufacturers' inventories at the end of January were ahead of December in all categories: 2,481,053 passenger casings, up 15.3%; 954,980 truck and bus casings, up 12.2%; and 4,120,673 tubes, up 12.3%.

The report covered only automotive pneumatic casings and tubes. It did not include any statistics on solid tires, or on pneumatic tires for motorcycles, bicycles or aviation, agricultural and industrial equipment.

New Pneumatic Cushion

In a recent speech before the National Farm Chemurgic Council meeting in St. Louis, Mo., Dr. M. C. Teague, of the U. S. Rubber Co., described several new contributions to every day comfort, including a new type of pneumatic cushion developed by his company. Using graphic diagrams, Dr. Teague showed the scientific tests and engineering work that led to the construction of the new cushion, known as Crestaire. The cushion contains Koylon foam rubber as padding material, while an elastic fabric named Luvon, a recent development of the company, is used as the upholstery material, Dr. Teague revealed.

To Build South African Plant

U. S. Rubber Export Co., Ltd., plans to construct a $5,000,000 plant at Port Elizabeth, South Africa, for the manufacture of a complete line of tires, footwear and mechanical goods. The company already has ordered the necessary equipment, and installation and operation is expected to begin by the first of next year. The Port Elizabeth area had been served since 1919 through the U. S. Rubber Export Co. (S. A.), Ltd. Products of the new plant, which will employ about 1,000, will also be exported to Rhodesia and Central Africa.

National To Move Offices

The general offices of the National Electric Products Corp. will be moved to the 13th Floor of the Chamber of Commerce Building, 411 Seventh Ave., Pittsburgh, Penna., on May 1. This move has been made necessary by the Veterans Administration's recent acquisition of the Fulton Building, where National Electric had maintained general offices for the past 40 years.

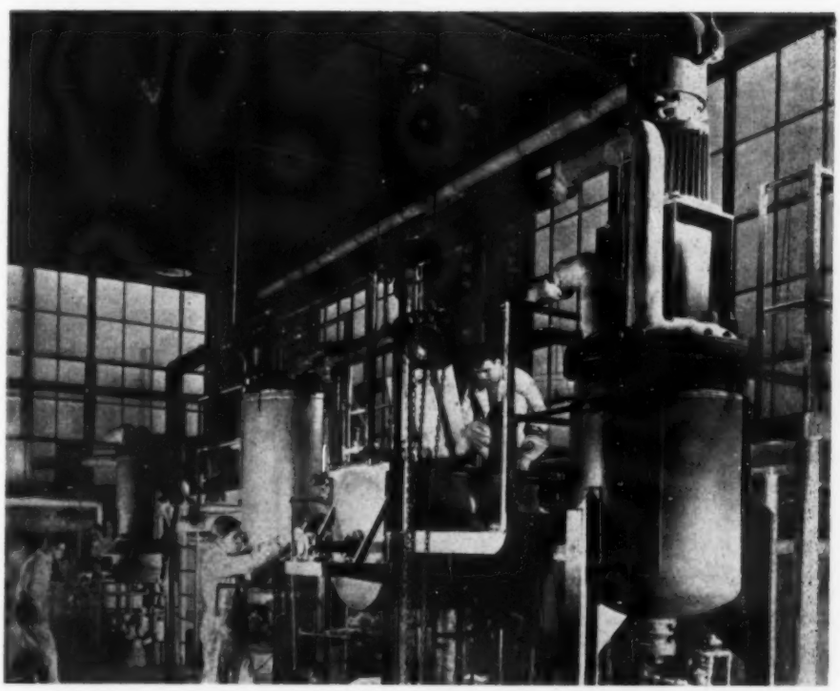
Tire Export Licenses

Export of vehicles equipped with pneumatic tires which have been used for less than 1,000 miles now requires an individual export license. An applicant for such a license must declare the model and type of vehicle; the number of tires required in the normal equipment of such a vehicle; the number, type, size and ply of the tires that have been used for less than 1,000 miles; and whether the tires are seconds, rejects, or government surplus. This step is the result of discovery of efforts to circumvent the restrictions on the export of new tires by placing the tires on new vehicles.

Correction

In Table II of the article on "A Comparison of Mineral Pigments in GR-S," by Messrs. Morris, James and Evans, in our December, 1945, issue, reference was made to "Raycal" as a titanium dioxide-barium sulfate mixture. The material is actually a titanium dioxide-calcium sulfate mixture.

WITCO CHEMICAL COMPANY COMPLETES MODERN PILOT PLANT



Witco Chemical Co. has recently completed a modern pilot plant in connection with the company's Chicago, Ill., laboratory. The pilot plant will be used for the development of new asphaltic and specialty products used in many industries, especially rubber, plastics and paints. A mechanical shop has been provided to facilitate installations and changes of equipment. Six large storage tanks for liquid materials are located outside the plant for safety reasons, and are piped so the contents of any single tank can be transferred to any other tank or equipment in the building. The company's Chicago laboratory, including the new pilot plant, is under the direction of Dr. F. E. Wagner. The photo above shows battery arrangement of jacketed mixers and reactors in the new plant.

COMMERCE DEPARTMENT SURVEY ON NATURAL RUBBER OUTLOOK

The United States rubber products industry must continue to rely chiefly on synthetic rubber at least until the end of 1946, according to a report on the 1946 outlook for natural rubber issued this month by the Department of Commerce and prepared by Everett G. Holt, Commerce Department Rubber Adviser.

According to the report, productive capacity for synthetic rubber is more than ample to meet all demands this year and imports of natural rubber, though increasing, will fall far short of total rubber requirements. The only short term course the United States can follow is to produce and use as much synthetic rubber as is required until the shortage of natural rubber ends, meanwhile using natural rubber prudently, Mr. Holt said.

The British-Dutch-French Rubber Study Group estimated in November, 1945, that approximately 625,000 tons of natural rubber from all sources would be received by consuming countries in 1946. If this figure is reached the United States is expected to obtain up to 300,000 tons by allocation. Declining shipments after 1946 are to be expected from countries that supplied us with rubber during the war. Amounts from Far Eastern countries liberated from Japan will depend upon how quickly their completely disrupted economic structures can be restored, the rubber advisor states. Complete rehabilitation will certainly be a matter of years.

Among factors favoring speedy resumption of rubber output in these areas are said to be their need for American exchange with which to purchase desired goods, the fairly satisfactory condition of rubber trees generally reported, and the availability of labor. The substantial damage done to buildings and equipment is not expected to be, in most cases, a limiting factor on production since damage can be repaired as rapidly as production can increase.

These favorable factors are heavily outweighed by adverse conditions, chief of which is the present political situation, the report states. Political disturbances virtually bar the shipment of rubber from Java and Sumatra and retard the movement of stocks from the interiors of these countries and Indo-China to ports of shipment. Rehabilitation and production on rubber estates in these countries are likewise being delayed by these same conditions. The native producer feels no urge to produce unless he can buy wanted merchandise in exchange. Hence, shortage of consumer goods is a factor second only to the political situation in retarding rubber production, Mr. Holt declares.

In Malaya, and probably in Sumatra, actual shortage of labor is expected to hamper severely the revival of production on estates. Additional laborers will have to be imported, but arrangements for such immigration have not yet been made. Other retarding factors are the disruption of transportation and shortage of transportation equipment. Reestablishment of motor and railroad transport and of service by harbor lighters, river boats, and trading vessels are required in all areas.

Rubber production is traditionally subject to swift changes. Since present estimates are conservative, it is felt that there may be more rapid increase in production than seems probable under existing conditions. Settlement of the political situation would greatly change the production outlook. Even without such settlement, it is difficult to believe that the huge production potentialities of Sumatra can long be completely bottled up while the world waits impatiently for natural rubber, Mr. Holt asserts. Under the best of conditions, however, the increase in rubber production in the liberated areas is likely to be gradual.

Coming Events

Apr. 22-27. National Plastics Exposition, Grand Central Palace, New York.

May 3. New York Rubber Group, Hotel McAlpin, New York, N. Y.

May 17. Detroit Rubber & Plastics Group, Detroit-Leland Hotel, Detroit, Mich.

May 24. Chicago Rubber Group, Hotel Morrison, Chicago, Ill.

June 7. Philadelphia Rubber Group, Annual Outing. (Tentative).

June 21. New York Rubber Group, Outing, Blasberg's Grove, Hawthorne, N. J.

June 24-28. A.S.T.M., 49th Annual Meeting, Buffalo, N. Y.

June 25. Rubber Division, Chemical Institute of Canada, Royal York Hotel, Toronto, Canada.

Sept. 8-15. American Chemical Society, Chicago, Ill.

Dayton Rubber To Date Tires

To assure tire customers that they are using tires embodying the latest synthetic rubber compounds, the Dayton Rubber Manufacturing Co., Dayton, Ohio, has announced that all passenger tires manufactured by the company will now have the month and year of manufacture molded into the sidewall.

Export Restrictions Removed

The Office of International Trade of the United States Department of Commerce has announced the removal of export restrictions on certain rubber products. The items which may now be exported freely under general license include aircraft and bicycle tires, casings and tubes, and rubber thread.

PASSENGER TIRE SITUATION IS REVIEWED BY COLLYER

In a recent address before the Chicago Technical Societies Council in Chicago, Ill., John L. Collyer, president of the B. F. Goodrich Co., asserted that while the passenger tire situation was improving it would be the end of the year before a motorist could buy the kind of tire he wanted. In the meantime, the auto owner probably would have to wait several weeks after placing an order for tires before getting delivery.

Although the set-back in the production of new automobiles had put a hardship on persons needing new cars, the situation had worked out to the advantage of persons needing tire replacements for old cars, he said. It had been hoped that by spring a million or more new passenger automobiles would have been built. Actually only slightly more than 200,000 have gone off the assembly lines. This means that at least 3,200,000 tires more than expected have been made available for replacements.

Estimates 90,000,000 Tires

Mr. Collyer declared that the rubber industry this year expects to make 90,000,000 tires, of which about 70,000,000 will be for passenger automobiles. Almost immediate delivery can be made on airplane tires, and, by midsummer, truck and farm equipment tires should be in ample supply. By the end of the year passenger tires should be available in unlimited volume and in any size, he declared.

Although passenger tires are selling at prices not more than 5 per cent above the pre-war levels, he explained the seemingly higher prices as the result of prewar competition, when, generally, tires could be purchased below list prices. When the supply catches up with the demand, there appeared to be no reason why price control regulation should be continued over tires.

During the next two years the country will need 400,000 to 600,000 tons of synthetic rubber because of difficulties in the import of sufficient supplies of natural rubber from the Far East, and in this period research on synthetic rubber should be pressed to assure the largest possible competitive advantages when the flow of natural rubber is restored, Mr. Collyer said.

Large scale synthetic production should assure a cost of 12 cents a pound, without allowance for amortization, depreciation, selling expenses and return on invested capital. If synthetic rubber production were carried on by private industry, the speaker said, only three to five cents a pound would be required to cover these charges, resulting in a price of 15 to 17 cents a pound. When natural rubber is flowing freely again, and when additional information is available through research, he felt it should be possible to get a true picture of the relative costs of the two commodities.

SURVEY SHOWS MOTORISTS PREFER RAYON CORD TIRES

According to the results of a nation-wide survey recently completed by the Graham Research Service for the American Viscose Corp., 350 Fifth Ave., New York 1, N. Y., 55 per cent of the people prefer rayon cord in their tires while only 17 per cent favor cotton. The remaining 28 per cent are undecided.

The results of the survey, which embraced the opinions of 1,389 motorists, was representative as to geographic area, sizes of cities, makes of cars owned, and age and economic status of the people interviewed. While the over-all sentiment was 3 to 1 in favor of rayon, it is noted that of those preferring rayon, almost 85 per cent did so for reasons of greater strength and wearing qualities. The survey showed a high percentage of awareness as to the purpose of the cord carcass in a tire. More than 85 per cent of the answers to this question related the cord to some aspect of strength, durability, structure or support.

Confirmation of this interpretation is found in the answers to the question: "Which construction features do you consider most important?" Only 15 per cent of the people regarded the type of tread as most important, 34 per cent thought the rubber composition (natural or syntlietic) should come first, while a total of 50 per cent rated the type of cord or the number of plies as most decisive.

Compared with the 85 per cent who favored rayon for reasons of strength and wear, only 54 per cent of the cotton advocates expressed their preference in these terms. Most of the remainder had no experience with rayon and based their preference on past satisfaction.

Among tire performance characteristics 60 per cent of the people considered safety from blowouts as most important, 20 per cent rated long mileage most desirable, 17 per cent favored ability to stand hard usage, and only 2 per cent rated easy riding first. As might be expected, 72 per cent of the women rated blowout resistance first in importance.

Woburn Appoints New Agent

In keeping with its expansion program, the Woburn Chemical Corp., Harrison, N. J., has appointed the Raw Materials Co., 77 Franklin St., Boston 10, Mass., its representative for the New England territory. Raw Materials Co., which also handles carbon black and pine tar materials in the New England and New York areas for Godfrey L. Cabot, Inc., will handle the complete line of Woburn fatty acids and synthetic drying oils.

An index to Vol. 58 of RUBBER AGE will be found on Pages 117 to 120 of this issue.

Solka-Floc Reduces Shrinkage

A satisfactory method of reducing shrinkage in white and colored rubber goods, including black stocks, is through the incorporation of a small percentage of Solka-Floc, according to the Brown Co., 500 Fifth Ave., New York 18, N. Y. Solka-Floc is the company's trade name for a line of fibrous, chemically purified wood cellulose products. The addition of 2 parts of Solka-Floc BW 40 per 100 parts of rubber in a base stock which exhibited shrinkage of as much as 15% is reported to have reduced shrinkage to a negligible amount with no significant effect on other properties. Because of its fibrous nature, Solka-Floc may also be used up to 20 parts as a stiffener of rubber compounds, permitting heavier loading of plasticizer. The Solka-Floc line includes several grades with a wide choice of particle size in each grade. The finer materials, such as Solka-Floc BW 200, are recommended by the company for use in latex compounding, including foam sponge, while the longer fibered products may be dusted onto a prevulcanizate to produce a suede-like finish. These fibrous materials can also be used in thermoplastic resin compounds, including the vinyls.

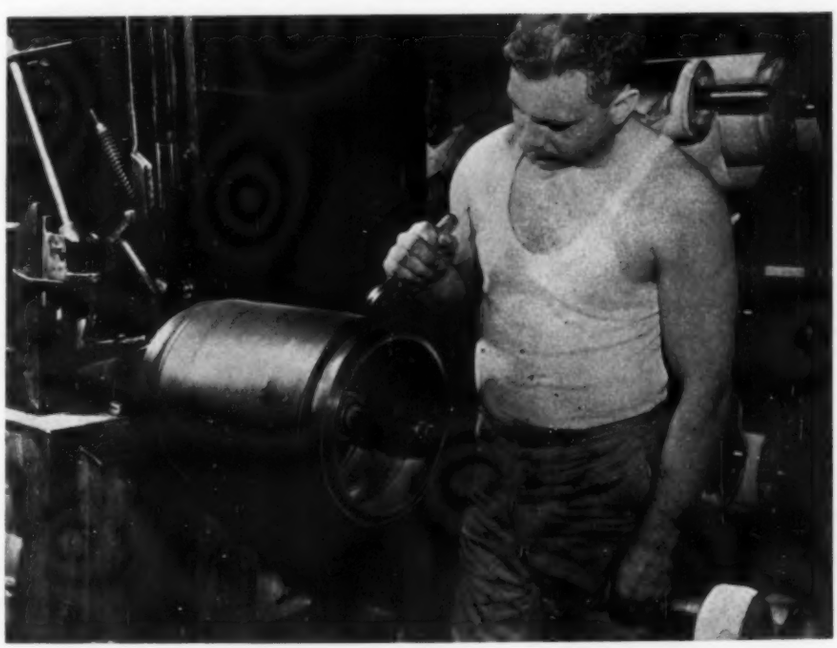
Goodyear Develops New Fabric

A method of producing a Pliofilm fiber which can be twisted into a thread and then woven into a fabric has been developed by the Goodyear Tire & Rubber Co., Akron. The thread can be produced in any color and by combining threads of various colors the resultant fabric can be given any desired pattern. The fabric is reported to be washable, waterproof and scarproof. Since the packaging field absorbs the entire amount of Pliofilm which the company is able to manufacture, Goodyear does not plan to launch Pliofilm fabrics on the market until natural rubber is again freely available.

Price of Perbunan Reduced

A price reduction on Perbunan dry rubber and Perbunan latex has been announced by Stanco Distributors, Inc., 26 Broadway, New York 4, N. Y. Under the new price schedule, Perbunan 18 ranges in price from 35c to 37.5c per pound, depending upon quantity, Perbunan 26 from 36c to 38.5c, and Perbunan 35 from 43c to 45.5c. Perbunan Latex Type H ranges in price from 38c to 42c per pound. Prices are f.o.b. plant or warehouse.

AUTOMATIC POWER ATTACHMENT FOR TIRE BEAD CONSTRUCTION



Goodyear Tire & Rubber Co., Akron, has announced that a new automatic power attachment for tire bead construction is adding strength and longer service life to farm implement and small size tractor tires which it produces. The new device is an attachment activated by electricity, which integrates the bead wire firmly into the tire, conforming to the minute specifications required. Both tire and bead are built in a single operation. Wire for the bead previously was transferred from a spool onto the tire by hand. Key to the improved method is its ability to keep the wire taut as it is rolled into the bead. A Goodyear tire builder is shown here rolling a bead flipper with the new electrical machine before inserting the bead wire.

STREET AND SEBRELL TALK AT SYMPOSIUM ON RUBBER

Dr. John N. Street, assistant director of laboratories of the Firestone Tire & Rubber Co., and Dr. L. B. Sebrell, director of research of the Goodyear Tire & Rubber Co., were the principal speakers at the Symposium on Synthetic and Natural Rubber, sponsored by the New York Chapter of the American Institute of Chemists, and held at the Building Trades Club, in New York City, on March 22. Dr. Street spoke on "Synthetic Rubber—What Now?" while Dr. Sebrell discussed "Plastics as Materials of Construction."

On the subject of "Synthetic Rubber —What Now?" Dr. Street declared that with conditions in the world rubber market unlikely to return to normal until late in 1947 or in 1948, the American synthetic rubber industry faces promising possibilities.

Declaring that today's synthetic rubber passenger tire gives as good or better trouble-free mileage as the pre-war natural rubber tire, Dr. Street added that progress has been made in research and development (in GR-S rubber) that has not yet been moved to production. Polymers have been road-tested and have shown improvement of a magnitude that would indicate even better wear than obtainable with natural rubber. A balance must be struck between quality and processing and polymer costs. GR-S has presented a fair balance, the speaker stated. Further developments are needed with these higher quality polymers in order to reach such a balance. The possibility of longer range development producing a better product from a service standpoint was pointed out.

As for heavy-duty truck and bus tires, the need for universal use is not imperative, according to Dr. Street, because extremely severe operating conditions which require application of natural rubber—high temperatures, high speeds and overloading—are found in only 40 per cent of the truck and bus tire business.

Commenting on the use of other types of synthetic rubber, Dr. Street said that Butyl might well gain preference over natural rubber in the manufacture of tubes because of its outstandingly better air-retention qualities, while the use of specialty rubbers such as neoprene, Thiokol and Buna N would expand.

Recalling the crisis in rubber encountered in World War II, he asserted that continuation on a long-term basis of research in synthetic rubber is desirable in the interest of the national welfare of the United States. On this basis, he urged a broad program on development of elastic polymers in a manner that will be effective not only from a theoretical, but from the practical standpoint.

Sebrell Discusses Plastics

In his talk on "Plastics as Materials of Construction," Dr. Sebrell first showed a series of tables outlining the properties of various plastics, including cellulose acetate, polystyrene and nylon, the chemical stability of cast allyl type resin, as compared with aluminum and steel, and production figures of various plastics over a period of years. He then launched into a discussion of some of the plastics and applications used in fabricating them.

Discussing the vinyl plastics, Dr. Sebrell covered coatings and extruded and molded products. In connection with coatings he mentioned that the vinyl resins were receiving considerable attention from manufacturers of floor coverings and had several advantages over rubber flooring, including resistance to sunlight and to grease and oil, as well as resistance to oxidation. It is these same properties, he stated, which have recommended this series of materials as replacements for rubber in several cases where rubber has previously been used.

The advantages listed as being favorable for the application of vinyl resins to coating materials apply in great measure to the products made by extrusion, the speaker continued, the processing of Saran into thread and the weaving of the thread into screening and upholstered materials being cited as examples. The use of Saran in the form of pipe which may be used for the transfer of corrosive chemicals was also mentioned.

As for molded products, vinyl objects molded in automatic molding equipment will in some instances perhaps entirely replace the same articles made by conventional methods from rubber, according to Dr. Sebrell, largely because of the fact that their manufacture is less costly when automatic machinery is used and also because of the fact that in many cases the products made from vinyl compounds are not attacked by oxygen, oil or ozone. As a typical example, he cited distributor nipples made from vinyl compounds.

Coming to the processes for plastics applications, Dr. Sebrell briefly described post-forming, laminating and sandwich-type constructions. He showed tables giving the average physical properties of laminated plastics, aluminum and steel; properties of low pressure laminating resins, and properties of cellular materials for sandwich construction. The latter table included properties of blown GR-N hard rubber, blown GR-S hard rubber, and others.

Taking up the subject of clear glasses, the speaker stated that the development of a clear glass-type of plastic which will be harder than Lucite and Plexiglas, which are acrylate derivatives and which were widely used during the war, would be most desirable. Improvements in hardness and scratch resistance are particularly called for, without loss in flexibility. CR-39, the allyl resin developed by Pittsburgh Plate Glass Co., was reported to be the first improved material of this type.

Concluding his talk, Dr. Sebrell discussed some of the synthetic resins made from rubber materials. He made mention of Pliolite, the resin developed from natural rubber by Goodyear, which has received considerable acceptance as a paint vehicle and as a moisture-vapor-resistant coating for paper. He also referred to Pliolites S-3 and S-5, the origins of which are entirely synthetic, and which have been found to be equally as satisfactory as the natural rubber Pliolite for the manufacture of cement paints, coatings for corrosion resistance, interior finishes, etc. In addition, these materials have been found to be valuable as stiffening agents for rubber.

Acetone Synthesis

Large-scale use in Germany of a new synthesis of acetone from acetylene is reported by the U. S. Naval Technical Mission in Europe. The process involves passing acetylene and water in the vapor phase over a catalyst of pure zinc oxide. The Germans claim that acetone yields from the process amounted to 80 to 90% of the theoretical yield. Though recovery of higher ketones and acetaldehyde would have raised the efficiency of the consumed acetylene, no attempt was made by the Germans to recover these by-products.

GENERAL TIRE REPORTS ON THIRTIETH YEAR OF ACTIVITY

New products, expansion of tire building facilities, and cooperative affiliations with other leading manufacturers marked the completion of the thirtieth year of the General Tire & Rubber Co., Akron, it was revealed in the latest annual report issued to stockholders.

The report indicated that affiliated plants in foreign countries had a most satisfactory year, including the company's tire plants in Mexico, Chile and Venezuela. In April the plant in Portugal is scheduled for an opening, the report revealed, and negotiations are pending in other countries for establishing manufacturing operations under the same methods used by the company in the past.

Referring to the continuation of management operations entered into in 1944, the report pointed out that during the year a controlling interest was acquired by the company in Aerojet Engineering Corp., which manufactures jet-assisted take-off rockets for airplanes at a plant located at Azusa, Calif. In addition to government orders still being received, a profitable field for the products in commercial aviation was visualized.

Another development reviewed in the expansion program includes the agreement with Liquid Carbonic Corp. to sell a combination electric refrigerator and freezing unit, known as Frostor.

REPORT ON RUBBER INDUSTRY MADE AVAILABLE BY HUTTON

A report on the rubber industry, which records the sales record of six leading companies from 1939 through 1945 and discusses the prospects of the industry for the next two years, has been made available by E. F. Hutton & Co., investment brokers, 61 Broadway, New York 6, N. Y.

After listing sales volume of the Firestone Tire & Rubber Co., B. F. Goodrich Co., Goodyear Tire & Rubber Co., the U. S. Rubber Co., the General Tire & Rubber Co., and the Lee Tire & Rubber Co. from 1939 through 1945, the report estimates a sales volume of $1,500,000,000 for the six companies in 1946. This projected volume is based on the assumption that the national income will be in the neighborhood of $140,000,000,000. It is an assumption, the report states, that has the support of a number of private and government economists, subject, however, to revision either upward or downward.

Earnings for 1946 in the rubber industry should be at record levels, substantially above those for the war years. Although increased costs will reduce profit margins from the high point reached in the last few years, they should remain at satisfactory levels unless the industry is forced to accept higher costs without compensating price increases. Some economies have already been achieved through increased productivity stemming principally from improved methods, the report declares, and the accumulative effect of many minor technological changes. It predicts that earnings will be improved over those of the war years in spite of lower sales volume primarily because of the elimination of the excess profits tax and smaller charge-offs to reserves.

The report states that uncertainties are likely to appear in 1947. "While the current demand picture indicates a high level of activity running through 1947," it declares, "it is likely, with the elimmation of the backlog of deferred demand and greater reliance upon the original equipment market, that the inherent competitive factors in the industry will become more pronounced. The present delay in getting passenger car production under way is favorable to the tire industry in that it allows a larger part of output to satisfy the immediate demands of the replacement market while the needs of passenger car producers are being deferred.

"However, when the new passenger cars reach the market in volume, the replacement market will shrink temporarily to subnormal requirements. Heavy demands for non-tire products exist also, but when the backlog of consumers' deferred purchases and inventory requirements have been met, a substantial reduction in output may also be expected."

Introduce New Tractor Tires

New wide base farm tractor tires that will give improved traction and approximately 40 per cent longer tread life than conventional tractor tires are being produced in eight sizes by the Goodyear Tire & Rubber Co., Akron. The new wide base tractor tires have Goodyear's open center "Sure-Grip" tread and because they are wider, permit 20 per cent more tread bar on the ground, thus increasing the traction. Longer tread life is made possible through the use of a new and improved tread compound. Conventional sizes, and the new wide base sizes of the tractor tires are: 9.00-36, conventional, changed to 11-36 wide base; 9.00-40 to 11-40; 11.25-24 to 13-24; 11.25-28 to 13-28; 11.25-36 to 13-36; 11.25-40 to 13-40; 12.75-24 to 14.24; and 12.75-28 to 14.38.

Incorporate Schenuit Rubber

Frank G. Schenuit Rubber Corp., Railroad & Union Aves., Baltimore 11, Md., has recently been organized and has acquired all the assets and liabilities of the Frank Schenuit Rubber Co. Officers of the new company include Frank G. Schenuit, president; Richard F. Going, first vice-president and treasurer; R. C. Neeley, second vice-president; and Eileen J. Coffay, secretary. Edgar Stillman is assistant to the president.

Opens Cleveland Sales Office

American Viscose Corp. has opened a sales office at 1318 Guardian Building, 629 Euclid Ave., Cleveland 14, Ohio, to service the tire manufacturing and textile trades in the Midwestern area. William J. Bieberle, previously associated with the company's Philadelphia sales office, is manager, while Harry A. Mason, formerly in the viscose yarn sales division of the New York office, is assistant manager.

To Increase Geon Production

An expansion program to more than double manufacturing facilities for its Geon polyvinyl resins has been inaugurated by the B. F. Goodrich Chemical Co., Cleveland, Ohio. A portion of the new output is expected to be available during the summer of this year and the balance of the facilities will be in production early in 1947.

Acetylene Black for Sale

Approximately 3,236,678 pounds of acetylene black, 50 per cent compressed in 12½-pound bags, and approximately 129,675 pounds, 110 per cent compressed in 25-pound bags, has been offered for sale by the War Assets Corporation. The material is located at Niagara Falls, N. Y.; Cleveland, Ohio; Mentor, Ohio; and Pittsburgh, Penna.

SEIBERLING ENTERS NEW TRADE AGREEMENT WITH FRENCH CONCERN

Seiberling Rubber Co., of Akron, has entered into a new trade agreement with the Bergougnan Rubber Co., of Clermont Ferrand, France, with which it maintained commercial relations in the pre-war period. Above, J. P. Seiberling, president of the American concern, is shown affixing his signature to the new agreement, with Andre Bergougnan, president of the French concern, seated at his right. Those standing are, left to right, Harry P. Schrank, Seiberling vice-president in charge of production; A. Farrar, director of the Bergougnan company, and C. A. Reed, assistant to Mr. Seiberling.

Chittenden and Vila Promoted

The Naugatuck Chemical Division of the U. S. Rubber Co. has announced the appointment of F. Dudley Chittenden and George R. Vila as assistant development managers of the Division. Both men make their headquarters at Naugatuck, Conn.

Dr. Chittenden, a chemical engineer from Yale University, first joined U. S. Rubber in 1926 as a chemist at its general laboratories and served later in the same capacity at the company's general products plant in Providence, R. I. In 1943 he was named chief chemist for the company-operated synthetic rubber plant at Institute, W. Va., and later became technical superintendent at that plant. In 1944 he returned to Naugatuck as a technical coordinator, subsequently being named factory manager of the Connecticut synthetic rubber plant in which capacity he served until his current appointment.

Mr. Vila received his A.B. degree in chemistry from Wesleyan University and his Master of Science degree in chemical engineering from the Massachusetts Institute of Technology. He joined Naugatuck Chemical in 1936 as a technical sales representative, specializing in rubber chemicals, and served in that capacity for six years. In 1942 he was transferred to synthetic rubber research and in 1943 became a technical coordinator for the synthetic rubber division in charge of research, development and quality control. In late 1945, as a member of a research group sponsored by the Office of Rubber Reserve, he went to Germany to investigate German research in the field of synthetic rubber.

Names New Vice President

General Tire & Rubber Co., Akron, has announced the election of Cyril F. O'Neil as vice-president in charge of foreign plants. Mr. O'Neil, associated with General Tire since 1922, served as Cleveland distributor until two years ago. He is now in Portugal attending to details involved in opening the company's new plant in that country. It was also announced that Charles E. Bittaker, formerly production superintendent, has been named factory manager of the company's Akron plant, with Harold J. Harmon, production manager, Charles Froelich, manager of waste and quality control, and Aaron Sheffler, manager of material control.

Schester with Screw Company

M. P. Schester, formerly manager of the Morristown, N. J., plant of the Flintkote Co., has joined the B. & S. Screw Co., Inc., 243 East 152nd St., New York 51, N. Y. The company manufactures automatic screw machine products which find application as inserts in the rubber and plastics industries. Inquiries along these lines are invited by the company.

Connors Joins Bishop and Peters

John J. Connors

John J. Connors, formerly general sales manager of the Irvington Varnish & Insulator Co., Irvington, N. J., has been appointed vice-president and sales manager of the Bishop Gutta Percha Co., New York City, and the Peters Manufacturing Co., Wollaston, Mass. Both companies produce gutta-percha adhesives, and rubber and plastic products for the electrical, beverage, packaging, textile, medical and other fields. The Bishop concern is one of America's oldest industries, having been established in 1847. Mr. Connors is a member of the Chemists' Club of New York, the American Institute of Electrical Engineers, the Society of the Plastics Industry, and the New York Board of Trade.

Seiberling Plans Expansion

Purchase of some of the machinery and equipment installed in the plant of the Seiberling Rubber Co. at Barberton, Ohio, by the government during the tire emergency program is planned by the company, in addition to the purchase of additional equipment. The planned purchases are in keeping with the company's program to expand production considerably. Approximately $700,000 will be expended for the equipment. In addition, Seiberling also plans on enlarging its plant at an estimated cost of $100,000.

Manufacturing Latex Products

The Midwest Rubber Company is the name of a recently organized firm at 17227 Conant Road, Detroit 12, Mich., which is engaged in the manufacture of latex dipped and sprayed products, including fountain pen sacs, curled hair, and coatings and linings. W. A. Kurt is president and treasurer of the company, and John W. D. Tassie is vice-president and secretary.

Burt and Schoenfeld Advanced

B. F. Goodrich Chemical Co., Cleveland, Ohio, has announced two new executive appointments. William I. Burt, formerly general manager of plants for the company, has been named vice-president in charge of manufacturing, while Dr. Frank K. Schoenfeld has been appointed vice-president of the company's technical division. Mr. Burt has been associated with the Goodrich organization since 1927 in the production of plastics, synthetic rubber and chemicals. During the war he served on the engineering design committee of the Rubber Reserve Corporation for the construction of government synthetic rubber plants. Dr. Schoenfeld is a graduate of the University of Michigan and received his doctor's degree in chemistry at Western Reserve University. He was formerly in charge of the parent company's technical operations and development, including the three government-owned synthetic rubber plants operated by Goodrich.

Synthetic Plant For Sale

The government-owned synthetic rubber plant at Velasco, Tex., operated by the Dow Chemical Corp., has been offered for sale by the War Assets Corporation. The plant has a rated capacity of 33,000 long tons of synthetic rubber a year. On a land site of 40 acres, the plant's buildings consist of a warehouse, constructed of brick and welded pipe strusses, and six other buildings, generally of wood construction. The warehouse has a floor area of 30,000 square feet, and the other buildings a combined area of 33,000 square feet. Machinery and equipment are designed particularly for the production of Thiokol-N synthetic rubber. Tanks, filters, heat exchangers, agitators, Dorr tanks, motors, conveyors, bucket elevators, vibrators, air blowers, and packing presses are located on the premises. The plant is served by four railroad spur tracks, and utilities are provided by the Dow Magnesium Plant, which is adjacent to it.

Technical Reports on Butex

Two technical reports which deal with Butex, a reclaim made from Butyl inner tubes, have been issued by the Midwest Rubber Reclaiming Co., East St. Louis, Ill. The reports, which contain data obtained at the Midwest laboratory, are entitled "GR-I Inner Tube Compounds Containing Butyl Tube Reclaim" and "Butyl Tube Reclaim Used as Replacement for GR-I."

Forms Chemical Division

General Mills, Minneapolis, Minn., has consolidated its activities in vegetable oils and protein derivatives into a chemical division under the direction of Sewell D. Andrews, Jr. Work with soybean proteins and polyamide resins will be stressed by the new division.

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Frequently camelback is vulcanized to carcasses that have seen hard service. While fabric and inside parts may appear strong and undamaged, some have actually suffered considerable deterioration. The new tread should be capable of running at a low temperature and at the same time present resistance to tearing, flexing and abrasion.

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Mechanical Goods

STATEX-B has many applications in the mechanical field. Outstanding advantages have been shown in GR-S belt friction and cover stocks. Under the severe conditions of high and low temperatures STATEX-B compounds display good performance and show superior flex resistance.

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FURNEX *The High Resilience Carbon*

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DESCRIPTION OF VARIOUS TYPES OF GR-S NOW BEING PRODUCED

Revised specifications for government synthetic rubbers, effective January 1, 1946, have been issued by the Office of Rubber Reserve, Reconstruction Finance Corp., Washington 25, D. C. The following short descriptive paragraphs of the various types of GR-S now being produced are taken from these specifications and are being published in the belief that they will supplement the information on the various x-number types published monthly in this journal:

GR-S and GR-S-38: GR-S is a copolymer of butadiene and styrene to which approximately 1.5% of a standard rubber antioxidant has been added during manufacture. Of the hydrocarbon present in GR-S, approximately 23.5% by weight is derived from styrene. GR-S-38 is GR-S made by a continuous process instead of by the standard batch process.

GR-S-10: A copolymer of butadiene and styrene to which approximately 1.5% of a standard rubber antioxidant has been added during manufacture. Of the hydrocarbon present in GR-S-10, approximately 23.5% by weight is derived from styrene. GR-S-10 differs from standard GR-S in that it contains a rosin acid derivative in place of a fatty acid.

GR-S-25: A copolymer of butadiene and styrene to which approximately 1.5% of a special stain-resistant antioxidant has been added during manufacture. Of the hydrocarbon present in GR-S-25, approximately 23.5% by weight is derived from styrene.

GR-S-50: A copolymer of butadiene and styrene to which approximately 1.5% of Stalite antioxidant has been added during manufacture. Of the hydrocarbon present in GR-S-50, approximately 23.5% by weight is derived from styrene.

GR-S-65: A copolymer of butadiene and styrene to which approximately 1.5% of a standard rubber antioxidant has been added during manufacture. Of the hydrocarbon present, approximately 23.5% by weight is derived from styrene. GR-S-65 has lower ash and better electrical properties than standard GR-S.

GR-S-85: A copolymer of butadiene and styrene to which approximately 1.5% of a standard rubber antioxidant has been added during manufacture. Of the hydrocarbon present in GR-S-85, approximately 23.5% by weight is derived from styrene. GR-S-85 differs from standard GR-S in that it is much more viscous than GR-S.

GR-S-AC: A copolymer of butadiene and styrene manufactured in the same manner as standard GR-S, except that in the coagulation process, alum is employed in place of salt and acid. Like standard GR-S, GR-S-AC contains approximately 1.5% of a standard rubber anti-oxidant. Likewise, of the hydrocarbon present in GR-S-AC, approximately 23.5% by weight is derived from styrene.

GR-S-12AC: A copolymer of butadiene and styrene to which approximately 1.5% of a standard rubber antioxidant has been added during manufacture. Of the hydrocarbon present in GR-S-12AC, approximately 23.5% by weight is derived from styrene. GR-S-12AC differs from GR-S-AC in that it is more viscous than GR-S-AC.

GR-S-20AC: A copolymer of butadiene and styrene to which approximately 1.5% of a standard rubber antioxidant has been added during manufacture. Of the hydrocarbon present in GR-S-20AC, approximately 23.5% by weight is derived from styrene. GR-S-20AC differs from GR-S-AC in that it is less viscous and can be processed more easily than GR-S-AC.

GR-S-Black-1: A mixture of 100 parts of a low viscosity GR-S and 50 plus or minus 2 parts of an easy processing channel black. The black is mixed with the GR-S during manufacture, while the GR-S is in the form of latex.

GR-S-Black-LAC: A mixture of 100 parts of GR-S-AC and 50 plus or minus 2 parts of an easy processing channel black. The black is mixed with the GR-S-AC during manufacture, while the GR-S-AC is in the form of latex.

Geneva Rubber Elects Officers

Geneva Rubber Co., Geneva, Ohio, recently organized for the manufacture of light mechanical goods, has announced the election of four executive officers. L. H. Huff, formerly a member of the Rubber Branch of the War Production Board and an executive of the Johnson Rubber Co., Middlefield, Ohio, has been elected president, with Thane L. Atwood, formerly superintendent of the Nic-Co Rubber Co., Connelsville, Penna., vice-president, James C. McMasters, until recently purchasing agent for the Johnson Rubber Co., treasurer, and William T. Parker, secretary.

NEW POLYMERS AUTHORIZED BY OFFICE OF RUBBER RESERVE, RECONSTRUCTION FINANCE CORPORATION

Listed below are types and properties of new experimental GR-S polymers (including GR-S latices) which have been authorized by the Office of Rubber Reserve, Reconstruction Finance Corporation, since publication of those listed in our preceding issue. Procedures for the distribution and sale of these polymers will be found in our October, 1945, issue.

X—Number Designation	*Manufacturing Plant*	*Date of Authorization*	*Polymer Description*	*Special Characteristics*
X-288-GR-S latex	Firestone (Akron)	3/5/46	GR-S latex with a high solids content of 55-60% with Daxad and potassium castorate as emulsifiers.	General purpose use.
X-289-GR-S	U. S. Rubber (Torrance)	2/8/46	Regular GR-S to be used as Standard Reference test sample beginning April 1, 1946.	
X-291-GR-S	Number cancelled			
X-293-GR-S latex	National Synthetic (Louisville)	3/5/46	Similar to Type II latex, with Daxad emulsifier, hydroquinone shortstopper and Stalite antioxidant.	For use in adhesives. Dry polymer from this latex is so sticky the Mooney is too low to be measured.
X-294-GR-S	U. S. Rubber (Institute)	3/6/46	GR-S-25, alum coagulated.	GR-S-25 is a copolymer of butadiene and styrene to which approximately 1.5% of a non-staining antioxidant is added. For use in stocks where this type of material is required.

DETROIT GROUP HEARS TALKS BY SOUTHWELL AND CUNNINGHAM

Approximately 175 members and guests attended the first meeting of the year of the Detroit Rubber and Plastics Group, which was held as a joint dinner-meeting with the Society of Plastics Engineers at the Detroit-Leland Hotel, Detroit, Mich., on March 15. The program featured two talks, one on "Postwar Uses of Vinyl Elastomers," by Jay Southwell, sales engineer in the Midwest territory of the Thermoplastic Department of the Bakelite Corp., New York City, and the other on "Butyl: A New Rubber," by E. N. Cunningham, of the technical sales department of Stanco Distributors, Inc., New York City.

Mr. Southwell, the first speaker, began his talk by describing the wide usage during the war of vinyl elastomers, particularly the copolymers of vinyl chloride, vinyl acetate, and high molecular weight polyvinyl chlorides. He then discussed the increasing post-war demands for the vinyl resins in those applications where improved resistance to flexing and oxidation, high luster and a wide range of colors are required. Vinyl resins, he declared, are being used in the automotive, electrical, home appliance, clothing and many other industries. They may be used in place of rubber in many automotive applications as distributor cap nipples, grommets, door lock knobs, brake and clutch pedal pads, steering wheels, and weather stripping. In the electrical field, molded vacuum cleaner parts, refrigerator gaskets, and washing machine parts are being manufactured from the vinyl resins.

The speaker also described Plastisol, a vinyl resin dispersion in plasticizers, which is used where pressure molding is not required. The dispersion can be set in a matter of minutes at 325-350° F. and is particularly adaptable for producing vinyl coatings around large or delicate inserts.

The second speaker, Mr. Cunningham, discussed the development of Butyl rubber, its properties and applications. The ability of Butyl rubber to withstand for long periods the deteriorating effects of sunlight, weather aging, acids, alkalies, oxygen, ozone, and fatty acids should provide certain products with longer life, he said. Mr. Cunningham employed colored slides effectively to illustrate his talk.

The remaining meetings for 1946 of the Detroit Rubber and Plastics Group have been announced as follows: Spring Meeting, May 17; Fall Meeting, October 18; and Christmas Meeting, December 15. All meetings will be held at the Detroit-Leland Hotel, Detroit, Mich.

Property responsibility and custody of the Hoosier Ordnance Plant, the nation's largest wartime powder bag-loading operation, located near Charleston, Ind., has been returned to the Federal government by Goodyear Engineering Corp., a subsidiary of Goodyear.

Back Issues Wanted

To complete sets of RUBBER AGE for binding purposes we need copies of the February, 1944, October, 1945, and January, 1946, issues. The sum of 50c will be paid for each of these issues returned to us in good condition. Please send the copies to Circulation Manager, RUBBER AGE, 250 West 57th St., New York 19, N. Y.

Rhode Island Hears Kavenagh

Approximately 120 members and guests attended the meeting of the Rhode Island Rubber Club, held at the Crown Hotel in Providence, R. I., on March 28. W. E. Kavenagh, manager, development department, Goodyear Tire & Rubber Co., Windsor, Vermont, the featured speaker, discussed "The German Rubber Industry," and outlined some of his experiences in Germany as a member of one of the technical investigating committees. The talk was similar in content to that given recently by the speaker before the Boston Rubber Group, an abstract of which has previously been published. During the course of the meeting a proposal to have the group come under the sponsorship of the Rubber Division, A.C.S., was approved, and steps toward this end will be taken.

California Hears Two Talks

Approximately 70 members and their guests attended the Spring Meeting of the Northern California Rubber Group, held at the Hotel Claremont in Berkeley, Calif., on March 22. The program consisted of two talks, the first on "Silicones," by C. E. Sanford, of the Dow-Corning Co., Midland, Mich., and the second on "The Development of Laminates," by Harry Kline, of the Reichhold Chemical Co., Detroit 20, Mich. In his talk, Mr. Sanford covered the general field of silicone compounds, with special emphasis on "Silastic," his company's silicone rubber. Mr. Kline first covered briefly the ways in which various plastics are being used, and then described the processes in the manufacture of paper, fabric and wood laminates.

Gates Technical Club Meets

Approximately 115 members and guests attended the March meeting of the Gates Technical Club of the Gates Rubber Co., held at the Albany Hotel in Denver, Colorado, on March 7. The meeting featured a round table discussion on "Is the Young Graduate Engineer Prepared to Take His Place in Industry?" Representatives from industry and several Colorado universities participated in the discussion.

O'BRIEN AND DUDLEY HEAD NEW CONNECTICUT GROUP

Balloting for regular officers of the recently-organized Connecticut Rubber Group, which held its inaugural meeting on February 15, was completed on March 22 and announced on March 29. The newly-elected officers assumed office at a meeting of the Executive Committee on April 5.

The officers are: *Chairman,* William J. O'Brien, Jr., (Seamless Rubber); *Vice-Chairman,* Raymond H. Dudley (Whitney Blake); *Secretary,* Alfred J. Jennings (DuPont); *Treasurer,* Edmond J. Butler (General Electric). The following were elected as directors: Frederick W. Holbrook (Naugatuck Chemical), George D'Olier (Raybestos-Manhattan), Stuart M. Boyd (U. S. Rubber), and Roger C. Bascom (Goodrich Chemical).

Paid membership of the new group now numbers approximately 150. Present plans call for three meetings a year plus a summer outing. The meetings will be arranged insofar as possible to avoid conflict with those of the New York Rubber Group.

The primary purpose of the group was outlined by the Executive Committee as being the promotion of better understanding of rubber technology among members of the rubber profession in the Southern Connecticut area. Particular attention will be given to placing the benefits of membership within the reach of the younger technical people who are not able to attend the meetings of other local rubber groups, such as New York. Non-technical personnel engaged in methods, production and purchasing work will also be welcomed into the group.

In order to eliminate unnecessary expense and to obtain the maximum in an educational sense from the two hours normally allotted to each meeting, the customary dinner and accompanying social preliminaries have been eliminated. This procedure was followed at the inaugural meeting and was well received.

Further information concerning the activities of the Connecticut Rubber Group, including data on membership, can be secured by writing to the secretary, Alfred J. Jennings, c/o E. I. du Pont de Nemours & Co., Fairfield, Conn.

To Expand Retort Division

Retort Chemical Division of the Cabot Carbon Co., a subsidiary of Godfrey L. Cabot, Inc., has announced that construction is under way at Gainesville, Fla., of two new retorts for distilling pine tars and oils for use in the rubber and paint industries. At present there are four retorts at Gainesville, with a monthly production of 65,000 gallons. The two new retorts will increase output by about 50 per cent, to a figure estimated at between 95,000 and 100,000 gallons a month. The retorts are expected to be in operation by September.

CHICAGO GROUP FEATURES SYMPOSIUM ON TEXTILES

A symposium on the use of various textiles in the rubber industry was the feature of the Spring Meeting of the Chicago Rubber Group, held in the Morrison Hotel, Chicago, Ill., on March 22. Principal speakers of the evening were Henry S. Grew, Jr., vice-president of Wellington-Sears Co., New York 13, N. Y.; Dr. W. W. Owen, of the Rayon Division of E. I. du Pont de Nemours & Co., Wilmington, Del.; and W. H. Atkinson, manager of the Chicago branch of the Owens-Corning Fiberglas Corp.

In his talk, Mr. Grew discussed the kinds and types of cotton textiles used in various rubber products and pointed out that the fabric of the future would probably be made from all-synthetic fiber or a mixture of natural and synthetic fibers.

In the second paper, Dr. Owen described the manufacture, properties and use of high tensile strength rayon in the tire industry. His talk was illustrated with slides as well as samples of finished rubber products.

The third paper was presented by Mr. Atkinson, who predicted various uses of Fiberglas in future rubber products. He displayed numerous samples of products which had been made with rubber and synthetic resins during the war period.

The next meeting of the Chicago Rubber Group is scheduled to be held at the Morrison Hotel, Chicago, Ill., on Friday, May 24. The following papers will be presented at the meeting: "Rubber to Metal Adhesives," by James A. Merrill, assistant director of research of the Goodyear Tire & Rubber Co., Akron; and "Reclaim Rubber During Reconversion," by J. M. Ball, of the Midwest Rubber Reclaiming Co., East St. Louis, Illinois.

Quebec Group Hears Jones

The last Winter Meeting of the Quebec Rubber and Plastics Group was held in the Ritz-Carlton Hotel, Montreal, Canada, on March 8, with C. L. Jones, development manager of the plastics division of the Monsanto Chemical Co., Springfield, Mass., presenting a talk on "Commercial Applications of Wartime Developments in Plastics." Mr. Jones discussed the war-born innovations and improvements in plastics which are being prepared for the civilian market, many of which are already in use. Among the improvements and innovations he described are the following: the conversion of vinyl butyral safety glass plastic to coating and proofing of fabrics; the improvement of injection molding techniques; the development of high temperature thermoplastics with excellent electrical properties; the initiation of low-pressure lamination using contact resins; the development of post forming techniques for high pressure laminates in compound-curved shapes; and the introduction of plastisol molding methods for vinyl resins.

Herbert Named Factory Manager

Joseph C. Herbert

Joseph C. Herbert, associated with the B. F. Goodrich Co. since 1927, has been named factory manager of the company's recently acquired tire plant in Tuscaloosa, Ala. Final construction work on the new tire manufacturing unit is under way. A graduate of Western Reserve University, of Cleveland, Mr. Herbert has been associated with Goodrich as secretary of Pacific Goodrich, assistant counsel of the parent company, and during the war period as assistant secretary and later manager of the Lone Star Ordnance Plant, Texarkana, Tex., operated by Goodrich for the government.

Anaconda Receives Naval Award

Anaconda Wire & Cable Co. has received the Naval Ordnance Award in recognition of "exceptional services to Naval Ordnance research and development." The award was based on one of the most sensitive devices that has come out of the war. The introduction of a small piece of steel, about the size of a penny, into the magnetic field of the Gradiometer coil, was sufficient to detonate the explosive contained in the device, which was used in magnetic underwater ordnance. During the war the company also supplied the Navy with large quantities of Degaussing cable, and provided the Army with field wire, assault wire, and many other war products.

Canadian Division to Meet

The next meeting of the Rubber Division of the Chemical Institute of Canada is scheduled to be held at the Royal York Hotel in Toronto, Canada, on June 25. No speakers have been announced at this writing, but an interesting program is promised. H. G. Deline, of the Dunlop Tire & Rubber Goods Co., Ltd., 870 Queen St. East, Toronto, Ontario, is secretary-treasurer of the division.

LOS ANGELES HEARS FOWLER TALK ON WAR DEVELOPMENTS

A record attendance of 254 members and guests heard Dr. William Fowler, of the California Institute of Technology, Pasadena, talk on "Technological Developments During World War II" at a meeting of the Los Angeles Rubber Group held at the Mayfair Hotel in Los Angeles, Calif., on April 2. The meeting was sponsored by the B. F. Goodrich Co.

In his talk, Dr. Fowler described the development of the atomic bomb, radar and other new technological achievements. He also showed color films depicting the development of rockets and rocket power, together with other technical developments in which the staff of the California Institute of Technology played a leading part.

Numerous prizes presented by Goodrich were distributed to the members and guests. The prizes consisted of two lengths of plastic garden hose, an automobile tire and two inner tubes.

Presiding over the program portion of the evening's entertainment were Lee Horchitz (Goodrich) and Bill Terdrieu (Goodrich). During the business part of the meeting, E. F. Tomkins (U. S. Rubber) was elected treasurer, replacing Paul Wineman (Goodrich), who has been transferred to another Goodrich plant. Maurice Chisholm (Kirkhill) was appointed chairman of the reception committee.

Name Officers for 1946

The newly elected officers for 1946 of the Northern California Rubber Group have been announced as the following: *President*, L. L. Shafer (American Rubber); *Vice-President*, George Farwell (Reliance Rubber); *Secretary-Treasurer*, B. O. Blackburn (Shell Development). The following were elected directors: Fred Swain (Pioneer Rubber Mills), Ross Morris (Rubber Laboratory, Mare Island Navy Yard), John Liljegren (Pioneer Rubber). In addition to the officers, Stewart Wade (American Rubber) has been named chairman of the Publicity Committee, and George Farwell (Reliance Rubber) chairman of the Program Committee.

N. Y. Group Selects Speakers

The program for the next meeting of the New York Rubber Group which will be held on Friday, May 3, at the Hotel McAlpin, will feature two speakers. According to present plans, A. E. Boss, manager, pigment sales, Columbia Chemical Division, Pittsburgh Plate Glass Co., will discuss the over-all synthetic rubber picture, and Wallace E. Cake, assistant managing director, Plantation Division, U. S. Rubber Co., will talk on natural rubber. W. James Sears, Director of the CPA Rubber Division, will give an after-dinner talk. Some entertainment will also be provided.

NAMES IN THE NEWS

CLARENCE E. STOUTENBERGH has been made general superintendent of the Lastex department of U. S. Rubber Co. at the Providence, R. I., plant and L. DEXTER ALDRICH general superintendent of the plant's mechanical goods department.

MORTON M. CHARNLEY, who served as manager of the traffic department of Carbon Black Export, Inc., New York City, for eight years, has been appointed manager of the export department of Godfrey L. Cabot, Inc., Boston, Mass.

LEONARD M. FREEMAN, associated with the B. F. Goodrich Co. for the past 20 years, most recently as technical superintendent of the Lone Star Ordnance Plant, operated by the company for the government at Texarkana, Tex., has been named manager of the company's newly established works laboratories at Akron which will handle technical service, development and training of technical personnel.

ROBERT S. CHILDS, technical representative on foam rubber products for the U. S. Rubber Co., has been appointed sales manager of the company's Koylon foam rubber products.

JOHN ANDREWS, recently discharged as a Major from the Army Air Forces, has joined the technical sales staff of Godfrey L. Cabot, Inc., Boston, Mass.

THOMAS J. CAIN, JR., formerly field representative of the Industrial Safety and Health Section of the U. S. Department of Labor, has been appointed director of safety for all Akron plants of the B. F. Goodrich Co.

H. D. KINSEY, formerly general superintendent of the atomic energy plant operated for the government by the Carbide and Carbon Chemicals Corp. at Oak Ridge, Tenn., has been appointed works manager by the company. R. K. TURNER, who had served since 1940 as superintendent of the company's plant at South Charleston, W. Va., has been named assistant works manager.

FRANK O. MORRIS, who has been associated with the Goodyear Tire & Rubber Co. for the past 28 years, most recently with the government-owned bag-loading plant operated by the Goodyear Engineering Corp. in Charlestown, Ind., has been appointed plant engineer at the company's tire factory in Norrkoping, Sweden.

H. C. CRAFTON, JR., formerly associated with the Okonite Co., is now chief chemist of the Morton Manufacturing Corp., Lynchburg, Virginia.

C. A. LORE, a division superintendent of the Wolverhampton, England, plant of the Goodyear Tire & Rubber Co. since 1933, has been transferred to the company's tire factory in Jackson, Mich.

NORMAN A. KLEMP, formerly with the U. S. Rubber Co., is now associated with the Revertex Corporation of America, Brooklyn, N. Y., as chief chemist in charge of product development and technical service.

P. J. LYNCH, associated with the Boston Woven Hose & Rubber Co. for the past few years, is now with the Electric Hose & Rubber Co., Wilmington, Delaware, as rubber chemist.

JAMES V. CARLIN, formerly Eastern sales manager of the Electric Hose & Rubber Co., Wilmington, Del., has been appointed sales manager of the Acme Rubber Manufacturing Co., Trenton, N. J.

JAMES C. RICHARDS, until recently manager of the government synthetic rubber plant at Borger, Texas, operated by the B. F. Goodrich Chemical Co., has been named sales manager of the company's synthetic and reclaimed rubber products.

ALBERT SMITH, formerly plant manager of the Ohio Rubber Co., Willoughby, Ohio, has been named plant engineer of the company's new $1,000,000 plant in Long Beach, Calif.

SAM L. BROUS, who has been associated with the B. F. Goodrich Co. in research, development and sales work since 1929, has been appointed manager of sales development for the B. F. Goodrich Chemical Co.

WALTER F. SPOERL, merchandise manager of the mechanical goods division of the U. S. Rubber Co. since 1944, has been named general sales manager of that division.

M. SCOTT MOULTON, manager of coatings and film materials for the B. F. Goodrich Chemical Co., has been appointed technical service manager for the company's Geon thermoplastic materials.

JOHN J. HOWE, recently discharged from the Navy where he was assistant to the Naval Inspector of Ordnance at the Navy's Charlotte, N. C., plant, and previously development chemist for the American Hard Rubber Co., Butler, N. J., has joined the Development Division of the Heyden Chemical Corp., New York 1, N. Y.

CLARENCE A. NORRIS, formerly associated with the development laboratory of the U. S. Rubber Co., in Detroit., Mich., has been appointed chief chemist of the stamping division of the Eaton Manufacturing Co., in Cleveland, Ohio.

EDWARD E. STEVENS, assistant general sales manager of the Mansfield Tire & Rubber Co., Mansfield, Ohio, has been named chairman of the public relations committee of the Mansfield Community Fund.

DR. PAUL O. POWERS, formerly chief of organic research for the Armstrong Cork Co., Lancaster, Penna., has been appointed to the staff of Battelle Memorial Institute, Columbus, Ohio, to aid in research on plastics, organic coatings, synthetic resins, plasticizers, and other phases of synthetic chemistry.

F. J. HAILER, JR., formerly associated with the plastics division of the Monsanto Chemical Co., Springfield, Mass., has joined the sales staff of Whittaker, Clark & Daniels, Inc., New York City.

E. V. DUFFY, recently discharged from the Army after four years of service, and previously a member of the service department of the Firestone Tire & Rubber Co., Akron, has been appointed service manager of the Pennsylvania Rubber Co., Jeannette, Penna.

DR. AUSTIN W. FISHER, formerly associated with the Barrett Division of the Allied Chemical and Dye Corp., New York City, has joined the staff of Arthur D. Little, Inc., Cambridge, Mass., as supervisor of chemical engineering research.

L. S. KNOUSE, associated with the Stanley Works for the past several years, was recently appointed sales manager of the Stanley Chemical Co., East Berlin, Conn.

S. M. ELLIOTT, who was associated with the farm service division of the B. F. Goodrich Co., Akron, for seven years, has joined the Seiberling Rubber Co., Akron, as assistant manager of tractor tire sales.

HAROLD WEIGOLD, who served in the Eau Claire, Wisc., plant in 1942 and 1943 when it was an ordnance unit operated by the U. S. Rubber Co. and then served as assistant plant manager at the Charlotte, N. C., plant, operated by the company for the U. S. Navy, has returned to the Eau Claire plant as assistant plant manager.

ARTHUR WOLF, special assistant on rubber, was recently given a Certificate of Award by the Navy for his meritorius civilian service in assisting the Navy "in finding solutions for the problems involved in the conversion of its requirements from natural to synthetic materials in the field of rubber and rubber products."

Develops High Solids Latex

The Goodyear Tire & Rubber Co., Akron, has announced the development of a new high solids synthetic rubber latex, which is reported suitable for use in the manufacture of dipped articles, or for many of the other uses to which natural rubber latex has been put. The high solids synthetic latex was developed by altering the proportion of styrene to butadiene, the use of a minimum amount of soap in making the emulsion, and the development of a new method of agitating the mixture during the process of polymerization. The new synthetic latex is expected to find large scale uses in the manufacture of rubber gloves and other dipped articles, insulation for wire and electrical devices, crepe rubber soles, adhesives and washable paints. When used in combination with other materials in adhesives, the new latex greatly increases the toughness of the adhesive which, frequently, suffer from brittleness. The latex not only gives the film greater toughness but also increases its flexibility and improves its resistance to water.

Change Hamilton Management

The Hamilton Rubber Manufacturing Corporation, a newly-organized concern, has succeeded the former Hamilton Rubber Manufacturing Co. The new concern, headed by Albert M. Kahn as president, will continue the manufacture of mechanical rubber goods at the Trenton, N. J., plant. A. Boyd Cornell, head of the former company, is executive vice-president of the new concern. Other officers include Ervin A. South, vice-president and assistant secretary; L. J. Howell, vice-president; Charles A. Gale, secretary, and O. E. Martens, treasurer. Mr. Kahn, president of the new company, is also president of the Acme Rubber Manufacturing Co., Trenton, a major interest in which he and a group of associates acquired some time ago.

Pioneer Rubber Elects Officers

Pioneer Rubber Mills, San Francisco, Calif., has announced the election of new officers. The new officers include: G. S. Towne as chairman of the board; H. R. Mansfield, president; and E. P. Coxhead, S. M. Suhr and F. W. Swain, vice-presidents. Mr. Swain is also in charge of factory operations in Pittsburg, Calif. Announcement has also been made of the voluntary retirement of D. D. Tripp, vice-president, after 46 years of service with the company.

New York Schedules Outing

A summer outing, the first in several years, will be held by the New York Rubber Group on Friday, June 21. It will be held at Blasberg's Grove in Hawthorne, N. J., and will feature a full day of sports activities. Peter Murawski (DuPont) is chairman of the Outing Committee. Further details will be published next month.

Cotton Visits United States

Frank H. Cotton

Frank Harriss Cotton, of London, England, who received one of the Leverhulme Research Grants for 1945 to enable him to make an intensive study of recent developments in rubber technology and the production and utilization of synthetic rubbers and allied plastics, has arrived in the United States. To carry out the purposes of the award, Mr. Cotton intends to visit rubber factories throughout the country, including the New York, New England, Akron and California areas, where he hopes to investigate the applications of materials and processes which have contributed to the winning of the war. Mr. Cotton became associated with the rubber industry in 1923 as works chemist with Rubber Industries, Ltd. When he received the Leverhulme award last year, he was a lecturer in rubber technology at the Northern Polytechnic, London, N. 7, England. During his stay in this country, Mr. Cotton can be reached at 244 Washington Ave., Rutherford, N. J.

Standard Develops Resinex L-4

A new liquid member of the Resinex family, which is said to have at least two potential uses in compounding GR-I (Butyl) inner tube stocks, has been developed by the Standard Chemical Co., 609 Akron Savings & Loan Building, Akron 8, Ohio. Known as Resinex L-4, this material has a specific gravity of 1.05, will flow at 3-6° C., and yet has very low volatility. According to the manufacturer, it can be used in standard GR-I where a small amount of softener is needed, but minimum breakdown of the sides of the unvulcanized tube is desired, and in GR-I 70 where large quantities of a plasticizer are required for processing purposes. Resinex L-4 is said not to upset rate of cure nor reduce modulus very markedly.

To Survey Far East Holdings

U. S. Rubber Co. has sent a party of four to the Far East to determine the preliminary steps necessary for resuming production of natural rubber on the 131,000 acres owned by the company in Malaya and Sumatra. The survey party is headed by M. Donald Knapp, formerly manager of all Far East plantations owned by the company. Other members of the group include: Valentine O. Goodell, recently associated with the Rubber Development Corporation; Dr. Glenn S. Meyer, chemist and formerly a member of the company's plantation research department; and Fred S. Carpenter, formerly manager of the synthetic rubber plant operated by the company at Los Angeles, Calif. To assess the damage caused by the Japanese occupation and to obtain an accurate estimate of the cost of repairing the losses, the group will appraise the condition of all producing trees, buildings, railroads, power facilities, roads, machinery, water supplies, and mechanical equipment. Steps necessary to rehabilitate the native population also will be an important part of the work.

Tire Report from France

Three of the largest rubber manufacturing plants in France, all located in the Lyon consular district, were producing 105,000 automobile tires and 530,000 bicycle tires a month at the end of 1945, according to a recent report from France. The Michelin plant at Clermont-Ferrand employed 20,000 workers before the war. Now, there are 12,000 workers, and the output consists of 80,000 automobile tires and 380,000 bicycle tires per month. All tires are 83 per cent synthetic rubber. The Bergougnan plant is much smaller than that of Michelin and is also located at Clermont-Ferrand. It employs 2,500 workers and produces about 10,000 tires a month. Its principal output, however, is rubber tubing, although it also manufactures rubber belting, soles and heels, and aviation tires. About 5,000 workers are employed at the Monthucon plant of the Dunlop Tire & Rubber Goods Co., Ltd. At the end of 1945 this factory was producing 15,000 automobile tires and 150,000 bicycle tires a month.

General Purchases Building

A new building, including a laboratory with 12,000 square feet of floor space, tire building machinery and Banbury mixers, has been purchased from the government by the General Tire & Rubber Co. The purchase price of the building, which is adjacent to the company's plant at Waco, Tex., is reported as $376,000. In addition, the company is leasing from the government a warehouse of 75,000 square feet of floor space, constructed by the Defense Plants Corporation during the war. This building will be used for warehousing and for the manufacture of inner tubes.

FINANCIAL NEWS

SEIBERLING RUBBER COMPANY REPORTS NET OF $504,882

Net income of $504,882 for the fiscal year ended October 31, 1945, after deducting all charges, including provisions for Federal income and excess profits taxes, adjustments, allowance for depreciation and special war amortization, but before renegotiation, has been reported by the Seiberling Rubber Co. After allowing $2.50 a share on the convertible prior preference and Class A preferred stock, this was equal to $1.33 a share on the common stock, which compares with a net of $510,145, before renegotiation, or $1.34 a common share for the preceding fiscal year.

Consolidated net sales for the current fiscal year amounted to $26,288,523, an increase of 14.7 per cent over sales of $22,904,821 reported for the previous year.

A statement accompanying the report reveals that under the sinking fund provisions in the company's articles of incorporation, applicable to the $2.50 convertible prior preference stock, the company during the year purchased, retired and canceled 1,026 shares of $2.50 prior preference stock, and as a result of conversion of such shares into common stock, satisfied the sinking fund requirements. The company also, in accordance with the sinking fund provisions of the indenture relating to its 4 per cent fifteen-year sinking fund debentures, retired $100,000 of the bonds on September 28, 1945, and arranged for a postponement of the operation of the contingent sinking fund requirements until February 27, 1947.

The consolidated balance sheet as of October 31, 1945, indicates total current assets of $7,078,651, including $1,176,661 in cash, $2,653,505 in accounts receivable, and $2,798,671 in inventories. Total current liabilities are reported as $1,925,254, including $1,331,860 in accounts payable, $380,671 in accruals, and $112,723 in Federal income and excess profits taxes payable. Total current assets compared to total current liabilities indicates a ratio of 3.44 to 1.

Master Tire & Rubber Corp.

For 1945: Net income of $312,380, which is equal to $1.99 on each of 156,721 common shares, and which compares with $300,845, or $1.92 a share, for the previous year.

American Hard Rubber Co.

For 1945: Net loss of $246,016, as compared with a net profit of $246,776, or $1.25 a common share, for the previous year. Sales of $8,199,689 compared with $9,497,704 in 1944.

Monsanto Chemical Company

Year Ended December 31: Net income of $5,318,003, after all charges, including $9,856,337 provision for income and excess profits taxes, which is equal to $3.49 a share of common stock, and which compares with $4,869,906, or $3.14 a common share, for 1944, when $8,810,561 was provided for taxes. Net sales reached a new high of $95,339,391, an increase of 8.4 per cent over the 1944 volume of $87,953,659. The company also has announced that stockholders would vote at their annual meeting on March 26 on a plan for refinancing.

Raybestos-Manhattan, Inc.

For 1945: Net income of $1,533,968, after deduction of $450,000 for contingencies and $3,771,162 for taxes, which is equal to $2.44 a share, and which compares with $1,677,465, or $2.67 a share, for the previous year, when $750,000 was deducted for contingencies and $8,624,053 for taxes. Net sales for the year amounted to $51,545,451, which compares with $62,580,741 for the previous year.

Columbian Carbon Co.

For 1945: Net profit of $3,352,008, which is equal to $2.08 a share, and which compares with $3,179,525, or $5.91 a share for the previous year. Dividend payments totaled $2,337,716 against $2,149,624 in 1944. Gross sales amounted to $27,244,318, the largest in the history of the company, and compared with 1944 sales of $23,562,381.

Minnesota Mining & Mfg. Co.

For 1945: Net income of $3,649,342, after deduction of $1,329,519 for unamortized balance of emergency facilities and $4,430,918 for taxes, which is equal to $1.87 a share, and which compares with $3,958,103, or $2.03 a share, for the previous year. Net sales for the year amounted to $63,548,377, which compares with $62,929,359 for 1944.

Mansfield Tire & Rubber Co.

For 1945: Net income of $569,613, which is equal to $3.42 a common share, as against $641,201, or $3.88 a share the year before. Net sales amounted to $25,902,681, as compared to $25,076,820 in 1944.

Intercontinental Rubber Co., Inc.

For 1945: Net income of $398,476, which is equal to 67c a share, and which compares with $355,374, or 59c a share, for the previous year. Sales of $4,923,071 compare with $3,072,592 for 1944.

MOHAWK RUBBER COMPANY REPORTS NET OF $343,970

Net profit of $343,970 for 1945, after deducting all charges, including $334,299 for amortization and depreciation and $1,028,324 for federal income and excess profits taxes, has been reported by the Mohawk Rubber Co. This is equal to $2.43 a share on 141,638 common shares, which compares with a net of $361,119, or $2.65 a share, in 1944.

Net sales in 1945 reached a new high of $7,857,399, an increase of 17 per cent over sales of $6,715,016 reported for the previous year, which had been an all-time high up to that point. During the war, according to the report, sales were doubled, the company's income and excess profits taxes increased over 500 per cent, and its profit varied less than $20,000.

The consolidated balance sheet as of December 31, 1945, indicates total current assets of $2,236,632, including $798,869 in cash, $782,255 in inventories, and $597,960 in trade accounts receivable. Total current liabilities are reported as $313,593, including $229,983 in accounts payable and $64,300 in federal taxes on income after deducting the cost and accrued interest of U. S. Treasury Notes held by the company.

The working capital of the company was increased $612,166 during the year and its ratio of current assets to current liabilities was better than seven to one. The reserve for general contingencies was increased to $100,000.

Dayton Rubber Mfg. Co.

Year Ended Oct. 31: Net profit of $431,466, after deduction of taxes, charges and adjustments, which is equal to 75c a share on the common stock outstanding on the two-for-one split basis effective January 4, and which compares with $781,716, or $1.95 on a lesser number of shares, for the previous fiscal year. Gross sales for the year amounted to $25,849,300, which represents an increase of 29% over the previous year.

General Cable Corporation

For 1945: Net income of $2,569,543, after deduction of $8,100,000 for taxes, but exclusive of $859,962 for profit on sales of securities, which compares with $2,855,572 for the previous year, when $11,800,000 was deducted for taxes, but including credit of $227,503 from renegatiations and $432,250 tax and renegotiation funds due to accelerated amortization.

National Rubber Machinery Co.

For 1945: Net income of $614,503, which is equal to $3.99 each on 154,000 common shares, and which compares with $285,069, or $1.85 a share in 1944. Net sales totaled $13,063,090 and compare with $8,568,615 for the previous year.

CANADIAN NEWS

In an interview in Montreal on March 26, E. R. Rowzee, director of research of the Polymer Corp., Sarnia, Ont., asserted that experts do not believe that synthetic rubber will immediately replace natural rubber, but if the former continues to improve in development and decreases further in price the changeover will come very shortly.

Synthetic rubber sells for 20 3/5 cents a pound as compared with 25 cents for the natural, he said. Tests have proved that the synthetic is in many cases better than the other. Another point in its favor is that it will mean stabilization of rubber prices. Previously these prices fluctuated more than those of any other vital commodity.

According to Mr. Rowzee, automobile inner tubes will never again be made of natural rubber since the synthetic type has proved definitely superior. Casings when made with 90% synthetic, 10% natural and with rayon cord, he said, have shown far greater endurance than tires made entirely of natural rubber.

In a subsequent address at a Kinsmen Club meeting in London, Ont., Mr. Rowzee spoke optimistically of the future of the $51,000,000 Sarnia plant. He revealed that in March the company had made substantial shipments of synthetic rubber to France and a small shipment to Norway, and that other orders were arriving from Denmark, Sweden and some of the South American countries.

A. H. Newman, public relations manager of the Polymer Corp., Sarnia, Ont., averred in a recent address before the Ottawa Optimist Club in Montreal that synthetic rubber products will be able to compete satisfactorily in price and quality with those made of natural rubber, and that both types of rubber will have their place in the future Canadian economy. Citing the durability of synthetic rubber tires, Mr. Newman pointed out that in a recent United States government test on synthetic truck tires driven at high speed over a rough course, spread with stones, holes, rocks, sand and other tire hazards, the average tire life reached 20,000 miles and in a number of instances exceeded 35,000 miles. This, under normal conditions, means that these same truck tires would have a life of about 50,000 miles, he said.

At the annual tire and tube development conference of the Dominion Rubber Co., Ltd., held recently at the company's Kitchener factory, F. C. Kennedy, head of the tire development division of the parent U. S. Rubber Co., stated that the development of rayon cord for use in tires is only in its infancy, and that newer cords of much higher tensile strengths and of greater resistance to breakdown by heat are being developed. These innovations will be available to tire users on the broadest scale within the next two or three years, he indicated. Engineers present at the meeting also pointed out that the new faster cars coming on the market this year and next will require tires more uniform in balance and radial and lateral runout.

D. W. Ambridge, president of the Polymer Corp., Sarnia, Ont., has revealed that wartime necessity of speeding synthetic rubber production forced the company to purchase equipment on the United States black markets. In a frantic search for certain types of valves, he declared, the company was forced to send agents throughout the United States in search of materials. The valves were obtained at black market prices in Salt Lake City, Utah.

Earlier expectations of a rapid resumption of large scale shipments of crude rubber from the Far East following the Japanese surrender have been disappointing, according to F. A. Warren, president of the Rubber Association of Canada. For several months at least there is little prospect of a material increase in the supplies of natural rubber available to Canadian industry. However, some natural rubber and much labor and equipment have been released from war production and have been speedily turned over to civilian production, he said.

A marked increase in the demand for new passenger car tires in the past few weeks is reported by Canadian dealers and distributors. Inventories, while showing some improvement since the first of the year, are still reported not up to normal and likely to show a declining trend. A shortage of new tires is foreseen around May or June as replacement demand is expected to increase with better weather and as the tire demand for new cars increases. Normally the big tire-buying season is from May to September. With plants working at capacity, manufacturers see little chance of stocking up to meet the expected heavier demands.

It seems likely that a commission of United States and Canadian representatives will soon investigate complaints that the St. Clair River is being polluted by the dumping of chemical discharges by the Sarnia synthetic rubber plant of the Polymer Corp. into the river. This is said to affect the water in the immediate area of Sarnia and Port Huron, Mich., and to be carried down Lake St. Clair to the Detroit River in the area of Detroit, Mich., and Windsor, Ont.

D. H. Gordon

who was recently appointed assistant to the president of the Dominion Rubber Co.

When the Sarnia plant first started operations, there were complaints by Port Huron residents, immediately across the river, that it created a smoke nuisance. Since then steps have been taken to reduce the smoke.

J. G. Williams, who has been associated with the Goodyear Tire & Rubber Co. for the past 17 years, and has been connected with the accounting division at Goodyear Aircraft at Akron since 1942, has been named assistant comptroller of the Goodyear Tire & Rubber Company of Canada, New Toronto.

Three new appointments have been announced by the Dominion Rubber Co., Ltd. D. H. Gordon, formerly general manager of the company's textile division, has been appointed assistant to C. C. Thackray, president, while M. H. Hudspeth, who was recently discharged from the Army, succeeds Mr. Gordon as general manager of the textile division. Paul M. Irwin, also recently discharged from the Army and previously associated with the Tire Division as manager of manufacturers' sales and later sales manager, has been appointed manager of special brand sales and tire engineering and service department of the tire division.

Pamphlets on Silastic

Dow Corning Corp., Midland, Mich., is making available a series of pamphlets entitled "Silastic Facts." The first pamphlet in this series offers a general introduction to Silastic, the company's silicone rubber, describing its heat stability, compression set, electrical properties, chemical resistance, tensile strength, adhesion and durability.

OBITUARIES

A. E. Warner

Arthur E. (Doc) Warner, vice-president of the C. P. Hall Co. and prominent rubber chemist, died on April 4 in Akron at the age of 64. Born at Mt. Holly, Vermont, Mr. Warner went to high school at Black River Academy,

Ludlow, Vermont, (from which Calvin Coolidge was graduated) and attended Buchtel, now Akron University. His first job was as assistant chemist for the B. F. Goodrich Co., where he later took charge of the laboratory. For two years he served as chief chemist at the Pennsylvania Rubber Co., and returned to Akron in 1909 to install a laboratory for the Miller Rubber Co. After a ten year stay with Miller he joined the Firestone Tire & Rubber Co. in 1919, and in 1920 became chief chemist for that company, later serving as consulting chemist. He became associated with the C. P. Hall Co. in 1930 and had been with that organization since. A widow and two children survive.

Raymond B. Price

Raymond Beach Price, pioneer in the development of reclaimed rubber, died of a heart attack in the Lompoc Hospital, Lompoc, Calif., on January 31, at the age of 73. Born in Newark, N. J., on December 4, 1872, he was a graduate of the Boston grade schools, English High School and the Massachusetts Institute of Technology, Cambridge, Mass., where he received a degree in chemical engineering in 1894.

After serving with the Boston Woven Hose Rubber Co. as chemical engineer from 1894 to 1898, he joined the Peoria Rubber Co. as superintendent for six months, leaving to help organize the Calumet Tire Rubber Co., Chicago, Ill. He was associated with Calumet, successively as superintendent, vice-president and manager, until 1902 when he suffered a physical breakdown. After his recovery, he visited Mexico and made a careful investigation of the possibilities of rubber culture in Tehuantepec, and was probably the first person to study guayule as a source of commercial rubber.

Mr. Price was the patentee of many processes in the rubber industry. Most important was his discovery of methods for reclaiming rubber, which was the basis for the Rubber Regenerating Co., which he established at Mishawaka, Ind., and of which he was a president for many years. The company also established a branch factory in England. Eventually the Rubber Regenerating Co. was merged with the U. S. Rubber Co., with Mr. Price serving as a director and vice-president.

Business took him abroad a great deal. He lived for several years in Paris, traveled widely, and became thoroughly familiar with the rubber industry throughout Europe and also with general political and social movements. A widow survives.

Karl E. Barton

Karl E. Barton, manager of the mechanical goods department of the Goodyear Tire & Rubber Export Co., died in the City Hospital, Akron, on March 21 of a cerebral hemorrhage, three hours after he collapsed while walking through the general office lobby of the Goodyear plant. He was 58 years old.

Born in Cumberland, Ohio, Mr. Barton attended elementary school in Cumberland and Wooster Preparatory School and Wooster College in Wooster, Ohio, graduating from the latter in 1911 with a B.A. degree. He taught school for three years before joining the Goodyear Tire & Rubber Company of Canada in 1914 as assistant manager of the mechanical goods department. He remained in Canada until 1937 when he was transferred to Wolverhampton, England, as manager of Goodyear's mechanical goods department.

Returning to Canada in 1942, he was named manager of general merchandise control and remained in that post until 1944 when he was transferred to Akron to head the mechanical goods department of the export company. A widow and son survive.

V. N. Peterson

Victor N. Peterson, control manager of the footwear plant of the U. S. Rubber Co. at Naugatuck, Conn., since 1934, died of a heart attack on April 6 in his home in Naugatuck. His age was 61. Mr. Peterson had been with U. S. Rubber for almost 40 years.

W. J. Voit

W. J. Voit, president of the W. J. Voit Rubber Corp., Los Angeles, Calif., died at his home in Pasadena, Calif., on March 17, of a heart ailment at the age of 66.

Born in Worthington, Ind., Mr. Voit entered the rubber industry in 1908 as a salesman for the Diamond Rubber Co., in Los Angeles, Calif., the company being later taken over by the B. F. Goodrich Co. He became Western sales manager for Goodrich, then transferred to the Norwalk Tire & Rubber Co. to serve as Western sales manager in their Chicago office. In 1923 he founded the W. J. Voit Rubber Corp., specializing in the manufacture of tire repair materials. Early in 1930 Mr. Voit began the development of rubber-covered athletic equipment, with which the company is identified today.

Although he had turned the active management of the company over to his son, Willard D. Voit, three years ago, Mr. Voit continued to take an active part in the development of new processes and new items. A widow and son survive.

M. Pancorbo

M. Pancorbo, manufacturer and distributor of the well known Span Grinder, died in his sleep at his home in New York City on February 16. Death was attributed to heart disease, from which he had suffered for a number of years. He was 57 years of age. Mr. Pancorbo was born in Madrid, Spain, and attended the University of Madrid from which he received a degree in engineering. For many years he operated an export and import business, specializing in rubber products, with offices both in Spain and the United States. He began the manufacture of the Span Grinder about 1930 and for the past fifteen years or so had concentrated on that machine.

N. C. Hilton

N. C. Hilton, executive manager of the Abrasive Wheel, Diamond Wheel and Bowling Ball Departments of the Manhattan Rubber Manufacturing Division of Raybestos-Manhattan, Inc., Passaic, N. J., died on March 14 in Glen Ridge, N. J. Born near Elmira, N. Y., Mr. Hilton was educated in Elmira schools, and joined Manhattan Rubber in 1915. During World War I, when the import of natural abrasives was curtailed, Manhattan's technicians, under Mr. Hilton's management, developed artificial abrasives. A widow, daughter and son survive.

A new series of plastics, identified as polystyrene materials of "the 1200 Lustron series," from which can be fashioned street markers or door numbers that glow visibly six to eight hours after exposure to sunlight or other illumination, has been developed by Monsanto Chemical.

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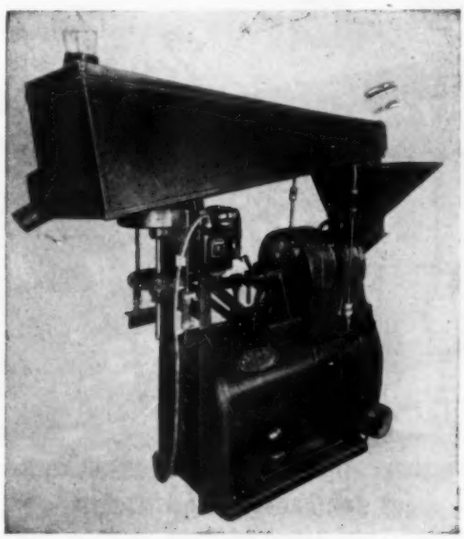

SPAN GRINDING MILL (Type VIII), illustrated above, reduces all grades of vulcanized rubber scrap to fine powder form ready to be mixed with ordinary molding compounds.

Provided with an attached vibrating screen, it is a compact, self-contained unit producing a uniform material automatically and at low cost. Capacity 200 to 400 lbs. per hour. Power required, 25 H.P.

Type X (not illustrated), for larger production.

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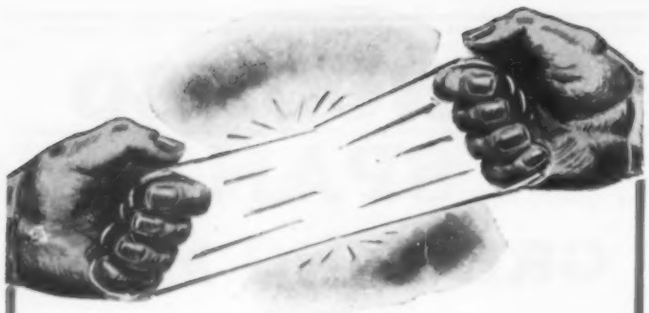

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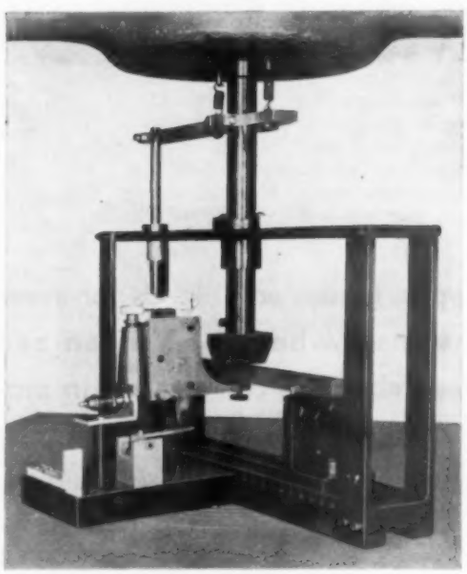

make tests in bending in accordance with the latest Federal specifications and those of the A.S.T.M., and will fit any testing machine.

The deflectometer measures the deflection from the center of the specimen and conveys this to an autographic stress-strain recorder which gives the load deflection curve. One of the important features of this instrument permits the operator to adjust the magnification of the deflection in multiples of 5, 10, 20, 50, 100 and 200 times. The high magnification ratio is used for very stiff and brittle materials that deform only slightly before breaking. The deflection, therefore, is measured in terms of thousandths of an inch. The low magnification permits recording large deflections which may be as much as two inches with very flexible materials.

In order to obtain tension, compression and flexure characteristics of the various plastic materials under extreme temperature conditions, the instrument has been designed to fit inside a cabinet in which the temperature can be controlled. The deflectometer will operate from —70° to + 170°F. Since a certain ratio must be maintained between the length and thickness of the specimen under test, the span is adjustable. The loading nose is guided so it will travel in a true straight line.

An Index to Volume 58 of RUBBER AGE will be found on Pages 117 to 120 of this issue.

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They are compact—they do not have metal seals—the body is made of cast bronze and steel parts are made of stainless steel—they will not corrode.

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A new electronic timer, suitable for all applications requiring highly accurate circuit timing has been developed by Electronic Controls, Inc., 44 Summer Ave., Newark 4, N. J. Time range of the new instrument is from 1 to 120 seconds, increments of one second, while accuracy of better than 5% is claimed. The unit is housed in a slope front steel cabinet. Two dials are provided for time selection, one calibrated in single seconds and the other in 10 second steps. The dials control tap switches. Unlike potentiometer control, the snap-positioning step-switches are said to assure precision control, with exact values of resistance inserted in the circuit at each position. A pilot light, toggle on-off switch, and a push-switch are included. A double receptacle permits timing two circuits simultaneously.

Prater Certified Permanent Magnet

The Prater Certified Permanent Magnet, a unit for the removal of tramp iron from material, has been introduced by the Prater Processing Co., 1825 South 55th Ave., Chicago 50, Ill. The new unit is adaptable for mounting either on feed tables or spouts at any point in the flow. It is of the two-gap type, with double Alnico magnets and triple plates, mounted in a one-piece bronze frame. The magnet is completely self-contained and requires no electrical connection. By the trapping of tramp iron and steel it protects equipment, eliminates fire hazard due to sparks or metal overheated by friction, and prevents contamination of finished material. The unit is approved by the Mill Mutual Fire Prevention Bureau.

Designed primarily for the safe and efficient handling of acid, a new and improved **safety siphon** made of an inert plastic has been announced by the Alden Speare's Sons Co., Cambridge, Mass. The new siphon is used to draw acid from carboys of from 5 to 13 gallons inclusive, and also from the side bung of 50 to 55 gallon drums.

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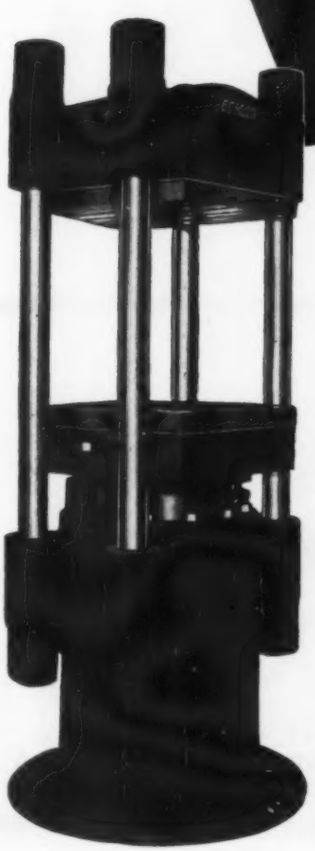

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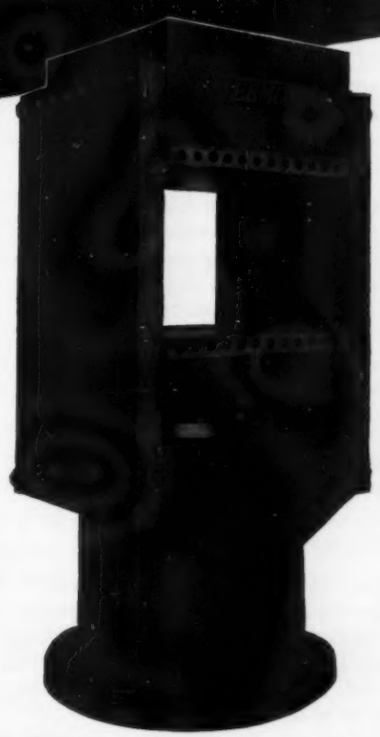

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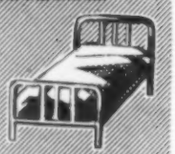
SAVES THAT MATERIAL

For upwards of 15 years, the Schuster Magnetic Calender Gauge has unerringly set rubber calender rolls to a predetermined thickness and correctly maintained that thickness. It has saved the time of hand-miking, eliminated human error, saved the stock sampled for calender tests, and assured uniform thickness in the finished product.

All this, *at the right time — before* damage is done. And *continuously* — the only way worth while.

The instrument is simple in design . . . rugged in construction . . . practically without wearing parts . . . adjustable to any thickness. Originally used for rubber, it has taken over just as deftly for synthetic rubber, plastics, cellulose, and other media. No matter what the article, your coating must be thick enough, but not even 1/1000″ too thick, or the war effort suffers irreparable loss. No matter what the material, you've got to s-t-r-e-t-c-h it as far as possible — and "possible" daily proves to have a new, elastic meaning.

Better investigate the Schuster Magnetic Calender Gauge at once, with or without automatic control. Every installation has to be engineered to the job . . . Please *give us time to do it right.*



Ask for our bulletin on the Schuster Magnetic Gauge.

THE MAGNETIC GAUGE COMPANY
60 EAST BARTGES STREET AKRON, OHIO
Eastern States Representative—
BLACK ROCK MANUFACTURING CO., Bridgeport, Conn.

Designed to provide extremely accurate control of electrically-heated furnaces and ovens, a new **electric type controller** has been introduced by the Bristol Co., Waterbury 91, Conn. The new controller combines a proportional input controller and a recorder in one case, and provides on-and-off type control with the advantages of proportioning control.

The **Worksaver Electric Truck,** a new unit which is said to reduce materials handling to little more than a strolling and steering operation, has been added to the line featured by the Yale & Towne Manufacturing Co., Philadelphia 24, Penna. Controls are so designed that when finger pressure is released the controls return to neutral, cutting off power. Two forward and two reverse speeds are provided.

The addition of a **shut-off valve** to its already large line of poppet type, air-operated valves has been announced by the Ross Operating Valve Co., 6430 Epworth Boulevard, Detroit, Mich. The new valve was primarily designed for use in air lines, but is also recommended for use in gas and low pressure liquid lines. Four standard sizes — ¼, ⅜, ½ and ¾ inch — are now in production.

One of the newest devices in the materials handling field is the **Load-Veyor Portable Conveyor,** a product of the Market Forge Co., Everett 49, Mass. Said to be the lightest weight steel conveyor available, the Load-Veyor is reversible so that either side may be used, one for the moving of large packages and the other for small packages, the side members acting as guide rails in the latter instance.

Two new models of the **Easy Reciprocating Electric Sander** — Models XL50 and XL90 — were recently added to the line featured by the Detroit Surfacing Machine Co., Detroit 4, Mich. The new models are said to be practically vibrationless, to cut much faster, and to be exceedingly simple to operate.

FOR EASY PROCESSING USE PHILBLACK A

FOR FURTHER DETAILS, SEE AD ON PAGE 4

We PROCESS LINERS of All Types ★

A Note or Wire Will Bring You Prices and Full Data Promptly

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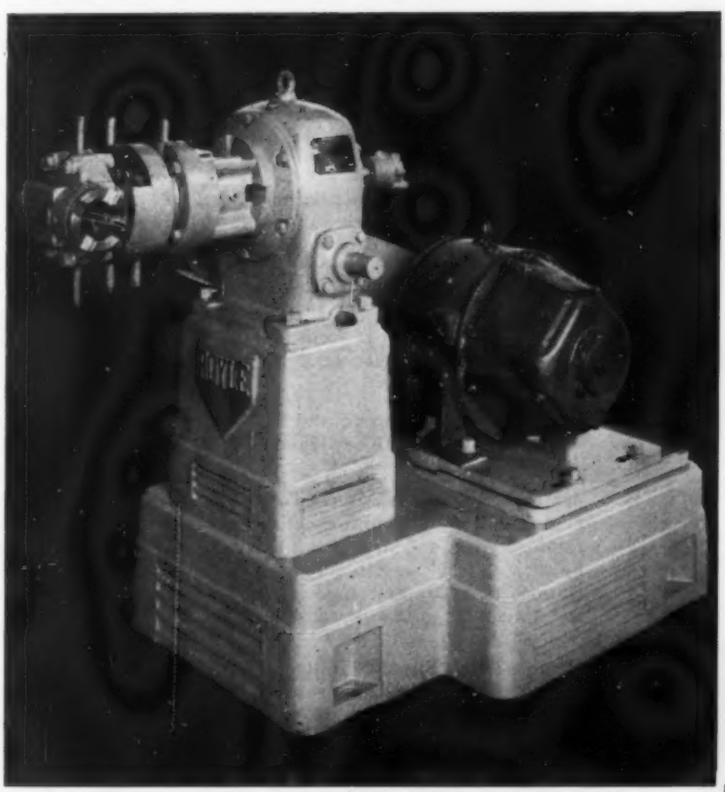

NO. 1 ROYLE CONTINUOUS EXTRUDER

Designed for Experimental and Product Extruding

Rugged is the word to describe this compact and highly efficient Royle continuous extruding machine. It embraces all of the characteristics required for larger and heavier extruding processes.

Primarily designed to become an integral part of laboratory equipment —the technician can be sure that his experiments will have a true relation to actual product extruding —the Royle #1 is an efficient producer of such commercial products as tubes, fine wire insulation, monofilament, and thread coating.

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accuracy in the

ATLAS *twin arc*
WEATHER-OMETER

Any selected cycle of exposure to sunlight and wetting can be set for automatic continuous testing in the Weather-Ometer. Exact tests can be duplicated at any time by settings on the control panel which contains temperature regulator—time meter—light and water cycle switch — automatic cut-off switch — voltage adjusting switch — direct reading thermal regulator — reactance coil (for economical current consumption). The Weather-Ometer is fully automatic in operation; can be left unattended over night; only necessary to renew carbons once in 24 hours. Years of exposure to any conditions of weathering reduced to a few days testing in the laboratory with the Weather-Ometer.

Originators and sole manufacturers of accelerated testing machines for over a quarter of a century. Fade-Ometer, Weather-Ometer, Launder-Ometer — the accepted standard testing machines used all over the world.

ATLAS ELECTRIC DEVICES CO.
361 West Superior Street, Chicago 10, Illinois

REVIEWS

BOOKLETS, CATALOGS, Etc.

Plastics and the Plastics Industry. George S. Armstrong & Co., Inc., 52 Wall St., New York 5, N. Y. 8½ x 11¼ in. 88 pp.

The seventh in a series of booklets published under the general heading of "An Engineering Interpretation of the Economic and Financial Aspects of American Industry," this booklet discusses the progress in the development of plastic materials and their conversion into usable form or applications. Divided into four sections, it covers the following: (1) Historical development and representative uses of plastic materials, including natural and chemical plastics; (2) The manner in which the fundamental natural resources are processed and the desired derivatives obtained from them for the manufacture of plastics; (3) Physical properties, production statistics, and postwar prospects of plastic materials; (4) The organization of the plastics industry, and the methods of converting plastic materials into usable end products.

•

Clevelands in the Modern Production Flow. Cleveland Worm & Gear Co., 3277 East 80th St., Cleveland 4, Ohio.

The applications of worm gear speed reducers to various types of mixing and grinding equipment are described in this pictorial bulletin. Illustrations featuring installations of worm gear units on equipment used by eleven industries for the processing of their materials are included. Each worm gear application is briefly discussed, and each photograph is accompanied by a facsimile blueprint detailing the drive application shown. The company's standard drives are illustrated in connection with typical installation views, with a description of the Speedaire fan-cooled unit which the company introduced recently.

•

Cochrane Multiport Relief Valve. (Publication No. 4150). Cochrane Corp., 17th St. & Allegheny Ave., Philadelphia 32, Penna. 8½ x 11 in. 28 pp.

The construction, installation, operation and applications of the company's safety valves are described and illustrated in this booklet. Among the numerous applications cited are those in the relief of steam, air, gas, gasoline and oil vapors, and water. The booklet includes a section, called "Sizing Data on Relief Valves," which presents capacity and pressure rise tables especially convenient for use in selecting the size of a valve for a specific need.

•

Eastern Midget Pumps and Laboratory Stirrers. Eastern Engineering Co., New Haven, Conn. 4 x 9 in. 20 pp.

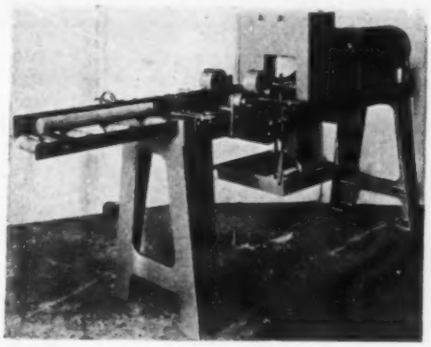
The construction, priming and control, specifications and performance of the company's line of midget pumps, and a description of its laboratory stirrers are furnished in this new catalog. It is the first new literature on small pumps issued by the company since before the war. Descriptions and illustrations of many new models both for regular industrial use and special types recently developed are included.

•

Taylor Level-Buoy. (Bulletin No. 98161). Taylor Instrument Companies, Rochester 1, N. Y. 8½ x 11 in. 8 pp.

A complete description of the company's Level-Buoy Indicating Controller is contained in this bulletin. Extensively illustrated with photographs and diagrams, it covers the purpose, construction features and operation of the instrument. In addition, the specific gravity, temperature, and liquid level limits at which the instrument can be applied are briefly discussed.

SLICER MACHINE FOR EXTRUDED STOCKS



With High Speed Disc Cutting Blade, Automatic Feed and with Tandem Feed Wheels. Capacity Section Up to 3" by 4½"—Length ⅛" to 4".

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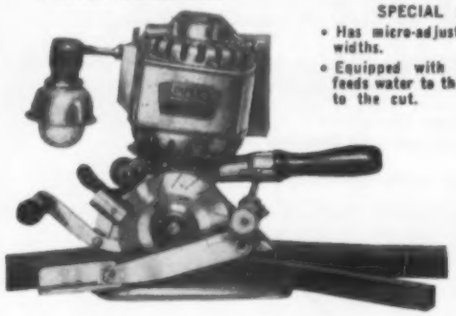
RUBBER STRIP CUTTER

PATENTED

A PORTABLE machine capable of stripping slab rubber up to 1″ thick at the rate of 20,000 feet in 8 hours. Any width desired.



SPECIAL FEATURES

- Has micro-adjustment for accurate widths.
- Equipped with water tank which feeds water to the slotted knife and to the cut.
- Has repulsion-induction motor which carries any overloads.
- Automatic sharpener device keeps knife keen and sharp.
- Has base with rollers and is very easy to handle.

Cuts within 1/64 inch to 1/100 inch tolerance depending on grades of rubber. Cuts a slab down to the last shaving. Cuts all grades of rubber including pure gum, sponge, etc. Cuts squarely—no rejects.

Now in use by many leading Rubber Manufacturers & Jobbers

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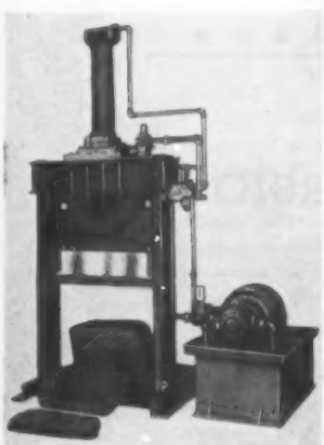
CRUDE RUBBER BALE CUTTER



Fully Assembled

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Furnished with

—Electric Motor

—Hydraulic Unit

—Control Valve

and Piping

An efficient machine of simple design for cutting bales of crude, synthetic and reclaimed rubber. Cuts without aid of water. One man operation. High production.

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SPADONE MACHINE COMPANY

10 East 43rd St. New York 17, N. Y.

REVIEWS (CONT'D)

Norelco Industrial X-ray Equipment. North American Philips Co., Inc., 100 East 42nd St., New York 17, N. Y. 8½ x 11 in. 12 pp.

This booklet describes the company's industrial x-ray equipment for fluoroscopy, radiography, diffraction and spectrometry, and discusses the operation of a number of models. It explains how x-rays can be used to reveal defects and flaws of products in the rubber, plastics, chemical and many other industries. Photographs and charts are employed to illustrate several x-ray radiograph models, an x-ray spectrometer and a camera-type x-ray diffraction unit. In addition, a convenient application chart which shows the x-ray unit best-suited for a given task is included.

•

Industrial Research. Arthur D. Little, Inc., 30 Memorial Drive, Cambridge 42, Mass. 8½ x 11 in. 24 pp.

This brochure describes the background and function of the company as industrial consultants in mechanical, chemical, biological and allied industries. The history of the company, from a two-room laboratory in 1886 to its present form today, and its accomplishments in industrial research during that period are described and illustrated with numerous excellent photographs. In addition, the kinds, costs and techniques of research undertaken by the company to aid management in its decisions on questions of policy which involve technological matters are discussed.

•

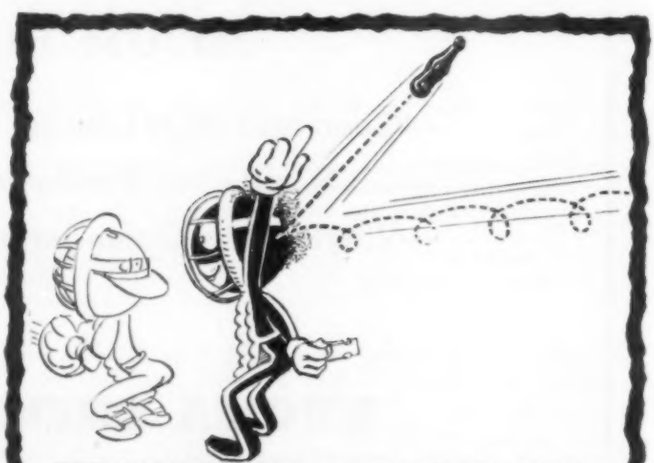
Pentalyn A and Pentalyn H. Hercules Powder Co., Inc., Delaware Trust Building, Wilmington 99, Del. 8½ x 11 in. 6 pp.

This technical bulletin describes the two tackifying resins produced by the company, which are particularly applicable in pressure sensitive adhesives based on synthetic rubbers, such as GR-S and neoprene. The properties of Pentalyn A and H, Staybelite Ester 10 and Hercolyn are presented, and emulsion formulas of these resins for use in latex adhesives are shown. The advantages of Pentalyn A and Pentalyn H, alone or modified with Hercolyn, are covered.

•

E.M. Adjustable Speed Magnetic Drive. Electric Machinery Mfg. Co., Minneapolis 13, Minn. 8½ x 11 in.

Factual data and over 40 illustrations covering the company's magnetic adjustable speed drive for boiler draft fans, centrifugal pumps, centrifugal blowers and compressors, and other loads where torque required decreases with reduction of speed, are presented in this new catalog. Principles of operation, performance characteristics, and applications are illustrated and described.



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FOR FURTHER DETAILS, SEE AD ON PAGE 4

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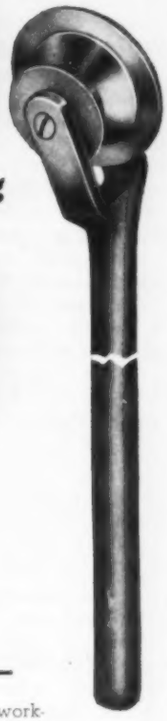
Since 1849

Cementing & Vulcanizing Tools



HUNDREDS OF DESIGNS —

Scores of standard tools carried in stock for working rubber, leather, plastics, paper, cement, etc. Special tools made to your order. Also—steel letters, figures, stamps, dies and molds. Explain the job, we'll suggest the tool.

HOGGSON & PETTIS MFG. CO.
141A Brewery St., New Haven 7, Conn.

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MOLD LUBRICANT

An *entirely new* and *different product*

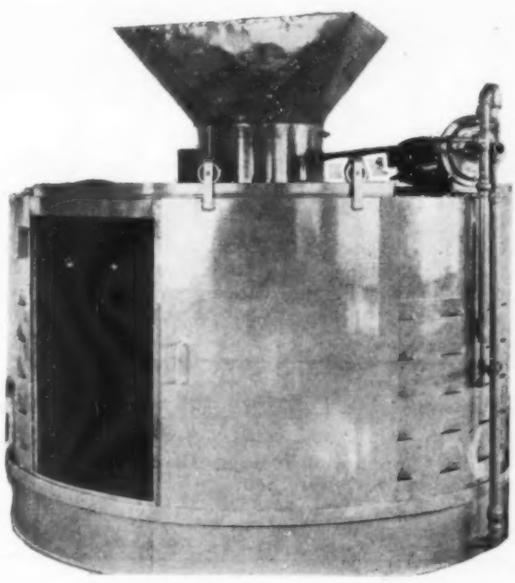
Keeps molds cleaner longer—Gives greater lustre to finished parts. Send for a Free sample and compare it in your own way. Many large companies are obtaining phenomenal results, and are using it *exclusively*.

RUBBER-SOL

Softens Rubber—cured and uncured. Salvage metal from rejects. Cleans screens, valves, molds, and has many other uses.

Let Us Know Your Problems

PREVENTIVE MAINTENANCE CO.
1997 Fairfield Ave., Bridgeport 5, Conn.



RUBBER SLAB COOLER

The mill room equipment at the left is used to lubricate cool and dry rubber slabs having been hand cut from a rubber mixing mill. Do that job for less money, in less floor space with cleanliness around your mills.

Simple to operate, practically no maintenance or care required.

Set in required location. No anchor bolt necessary. Connect electrical line, water and drain. It is then ready for operation. FURTHER DETAILS UPON REQUEST.

The Akron Standard Mold Co.
Akron — "The Established Measure of Value" — Ohio

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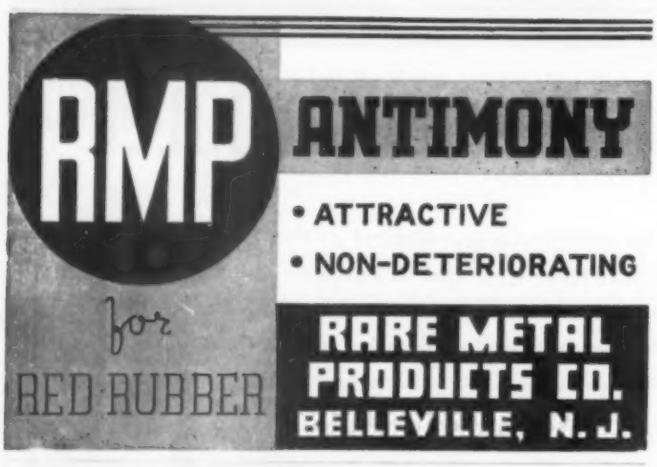

REVIEWS (CONT'D)

Witcarb R: Rubber Reinforcing Pigment. (Bulletin 45-2). Witco Chemical Co., 295 Madison Ave., New York 17, N. Y. 8½ x 11 in. 36 pp.

Data on the behavior of Witcarb R, the company's ultra-finely divided precipitated calcium carbonate, in GR-M, GR-I, Hycar, Chemigum, Perbunan, Reclaim, and Reclaim-GR-S mixtures, is presented in this technical report. Comparisons of various loadings with other inorganic and carbon black pigments at a loading of 100 parts by weight are made. The current work supplements the results of an earlier bulletin which covered the reinforcing action of Witcarb R in natural rubber and GR-S. The results indicate that Witcarb R has a definite reinforcing action, improving tensile, tear, and abrasion resistance of the elastomer formulations tested.

•

Cabot Carbon Black: Industrial Highlights. Godfrey L. Cabot, Inc., 77 Franklin St., Boston, Mass. 8½ x 11 in. 16 pp.

This booklet is the first in a series of graphic presentations to be issued by the company aimed at those industries in which carbon black plays an important role. The manufacture of carbon black and its relation to the fields of rubber and ink manufacture is covered in this booklet. Abundantly illustrated with photographs, it describes the steps in the conversion of carbon black from natural gas, and pictures the uses of carbon black in rubber and printing ink. In addition it presents a home-spun story of the employees in the company's Kermit, Texas, plant.

•

Heresite Coatings, Resins and Compounds. Heresite & Chemical Co., Manitowoc, Wisconsin. 6 x 9¾ in. 48 pp.

The numerous plastic coatings, synthetic resins, and molding compounds developed, manufactured and sold by the company are described and discussed in this booklet. Physical test results on the various compositions, particularly from the standpoint of corrosion control, are sprinkled throughout. Specific applications in several fields, including the chemical, textile, marine, dairy and home appliance industries, are both illustrated and covered in the text. Some information on the company's butadiene copolymer, now being produced on a pilot plant estate, is also included.

•

Dow Corning Silicones: New Engineering Materials. Dow Chemical Co., Midland, Mich. 8½ x 11 in. 12 pp.

Practically all of the numerous Dow Corning silicone products now available are listed and described in this new catalog. In addition, the catalog contains many charts and graphs demonstrating the unusual properties of the rapidly-increasing family of organo-silicon-oxide polymers.

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Synthetic Latex

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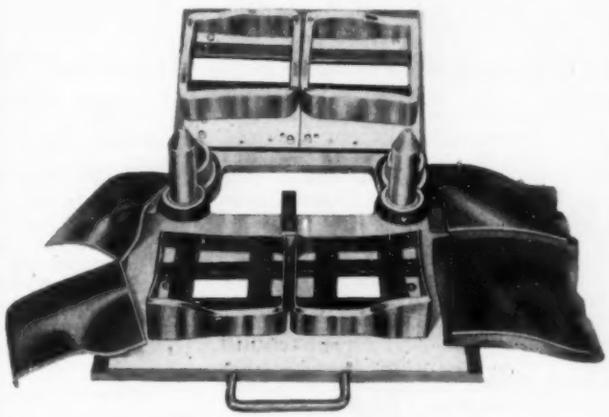
SHARP EDGE CUTTING DIES

Also PERFORATING TUBES and COLLETS of All Types



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Commercial Rubbermakers' Sulphur, Tire Brand, 99½% Pure
Refined Rubbermakers' Sulphur, Tube Brand, 100% Pure
Carbon Tetrachloride, Carbon Bisulphide
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MARKETS

Rubber – Crude, Reclaimed and Scrap – Cotton – Ducks – Tire Fabrics – Sheetings

NEW YORK APRIL 16, 1946

Natural Rubber

ALTHOUGH shipments of natural rubber continue to come from Far Eastern areas, the over-all quantity is disappointing and indicative of the fact that the United States is likely to receive far less than the original 300,000 long tons estimated for 1946. It is quite probable that in view of continuing political disturbances in the Netherlands Indies, lack of labor in Malaya, poor transportation facilities, and other factors, less than 250,000 long tons of natural rubber will actually be received by the United States from the Far East this year.

According to the latest report from Batavia, political unrest in the Netherlands Indies is barring agents of major rubber interests from their former estates in Sumatra. Awaiting the settlement of internal conditions and the resumption of commercial life are agents of U. S. Rubber, Goodyear, the Continental Rubber Co. of New York, and the Hawaii-Sumatra Co. No definite knowledge of the condition of the plantations owned by these interests is available, and resumption of rubber cultivation and production will be delayed until the various concerns can reclaim their plantations.

An interesting report has also come from Tokyo. According to this report, the Japanese government has been ordered by Allied Supreme Headquarters to prepare for export to the United States some 10,000 metric tons of rubber, not less than half of which must be top grade and the balance of "grade two." Orders covering antimony and tin were issued at the same time.

Prices shown below are ceilings set by the Office of Rubber Reserve, Reconstruction Finance Corporation:

	C	N-C
Plantations—		
Ribbed Smoked Sheets, 1X...	22½	40
Thick Pale Latex Crepe, 1X..	22½	40
Thin Pale Latex Crepe, 1X..	22½	40
Thick Brown Crepe, 1X.....	21⅜	38⅞
Thin Brown Crepe, 1X.....	21⅜	38⅞
Thick Remilled Blankets, #1..	21⅜	38⅞
Rolled Brown or Flat Bark..	18	35½
Smoked Blankets, #1.....	21⅜	38⅝
Claro Brand 1XRSS.....	22½	40
Sole Crepe Trimmings.....	22	39½
Sole Crepe	22½	40
Wild—		
Uncut Fines, Crude.....	15	29
Cut Fines, Crude.....	15½	29¾
Cut Fines, Washed & Dried..	22½	40
Upriver Coarse, Crude.....	12⅝	26⅝
Upriver Coarse, Washed & Dried	20⅛	37¾
Caucho Ball, Crude	11⅝	24¾
Caucho Ball, Washed & Dried	19½	37
Guayule—		
Carload Lots	17¾	31
Less than Carload Lots	18	31⅝
Balata—		
Surinam Sheet	42½	42½
Manaos Block	38¾	38¾
Colombian Block	38¾	38¾
Peruvian Prime	38¾	38¾
Chicken Wire	23¾	23¾
Latex—		
Normal, Tank Car Lots	26	43½
Creamed, Tank Car Lots	26¾	44¾
Centrifuged, Tank Car Lots..	27¾	45¾
Heat-Concentrated, Carload Drums	29½	47

C for Civilian Use; N-C for Non-Civilian Use.

Scrap Rubber

The scrap rubber market is reported as rather dull at the moment, with reclaimers apparently reluctant to make heavy purchases. This attitude is largely attributed to expectancy of lower prices in the near future, plus the belief that increased production and distribution of passenger car tires will bring larger quantities of natural rubber scrap tires into the market. Dealers report increased demand from the export field, with most transactions awaiting dollar arrangements. Prices shown below are ceilings on typical grades of scrap:

(Prices to Consumers, Delivered Akron)

Mixed passenger tires	ton	$20.00
Beadless truck tires	ton	26.00
Mixed truck tires	ton	20.00
Beadless passenger tires	ton	26.00
No. 1 passenger peelings	ton	52.25
No. 1 truck peelings	ton	52.25
No. 2 passenger tubes	lb.	.07¾
Red passenger tubes	lb.	.07½
Black passenger tubes	lb.	.06¾
Mixed passenger tubes	lb.	.06½
No. 2 truck tubes	lb.	.07½
Red truck tubes	lb.	.07¼
Black truck tubes	lb.	.06½
Buffings	ton	35.00
Bicycle tires	ton	15.00
Air bags and water bags	ton	15.00
Boots and shoes	ton	33.00

Tire Fabrics

Supply of tire fabrics remains in tight position with little hope seen for easing conditions in the near future. Although some tire plants are reported to be facing curtailment of operations due to insufficient deliveries, no actual shut-downs of tire manufacturing departments due to lack of tire cord have yet occurred. Some relief is expected by the industry as a result of new amendments to Orders M-317 and M-317A, these amendments reinstating channeling controls over industrial cotton fabrics in general. The speed with which textile mills are able to comply with the provisions of the new amendments, and thus relieve the over-all tight situation, is problematical. Prices shown below are ceilings on typical grades of tire cord:

Standard, Peeler, 12/4/2	lb.	.50½
Standard, Peeler, 14/4/2	lb.	.51¾
Standard, Peeler, 16/4/3	lb.	.52¼
Extra Staple, Peeler, 12/4/2	lb.	.57¼
Extra Staple, Peeler, 14/4/2	lb.	.58¼
Extra Staple, Peeler, 16/4/3	lb.	.59¼

Note: Under OPA regulations mills in Band A add 7.98% to the above prices; mills in Band B add 4.55%.

Sheetings

48x40	36	in.	5.50	lb.	@ 8.272
40x40	36	in.	6.15	lb.	@ 7.398
40x36	36	in.	6.50	lb.	@ 7.000
48x48	40	in.	2.50	lb.	@17.200
48x48	40	in.	2.85	lb.	@15.087
56x60	40	in.	3.60	lb.	@12.638
48x44	40	in.	3.75	lb.	@11.733

Note: Prices shown above are ceiling prices set by order of the O.P.A.

Cotton

The price of middling uplands on the Cotton Exchange has swung in the wide range of 160 points since our last report (March 13), high for the period being 28.79 on April 6 and low 27.19 on March 15. The average price for middling uplands for the month of March was 27.52, based on 26 trading days. There was a steady upward advance of prices from mid-March through the first week in April which was attributed largely to political factors, including Congressional efforts to curb Office of Price Administration authority over agricultural products, Congressional opposition to the increase in margin requirements on cotton futures trading, together with a questioning of the legality of the move, and improved chances for enactment of the Pace parity bill. However, prices declined sharply during the second week in April after the OPA ordered uniform higher margin requirements for transactions in cotton futures. The greatest break in prices was recorded on April 12, with a drop to 27.87, a decrease of 57 points over the previous day. Continued effort toward the enactment of the Pace Bill this year is expected to reverse the downward trend and maintain prices at current or even higher levels. Quotations for middling uplands on the Exchange follow:

	March 13	April 16		
	Close	High	Low	Close
May	26.71	27.61	27.52	27.60
July	26.75	27.79	27.65	27.68
October	....	27.73	27.60	27.64

Reclaimed Rubber

No slackening of any kind in the peak demand for reclaimed rubber has been noted since our last report, and reclaimers are still hard put to fill existing orders. The demand from the export field continues to increase but few reclaimers are in a position to accept such orders. The labor situation continues to show signs of improvement but increased productivity is dependent on machinery and equipment rather than increased manpower. One of the larger reclaimers is understood to be gradually withdrawing from the field and is not accepting any contracts beyond the end of the current year. Reclaimers report scrap supplies in fair quantity. Prices below are ceilings on typical grades of reclaim:

Shoe				
Unwashed	lb.	.07½	@	.07¾
Tube				
Black Tube	lb.	.11¾	@	.12
Red Tube	lb.	.12½	@	.12¾
Tires				
Black (acid process)	lb.	.08	@	.08¼
Black, selected tires	lb.	.07	@	.07¼
Truck, Heavy Gravity....	lb.	.09	@	.09¼
Miscellaneous				
Mechanical blends	lb.	.05	@	.06
White	lb.	.13½	@	.13¾

Ducks

Enameling (single filling)....	lb.	—	@	.44¼
Belting and Hose.....	lb.	—	@	.39
Single filling, A grade.....	lb.	—	@	.19¾
Double filling, A grade.....	lb.	—	@	.20¾

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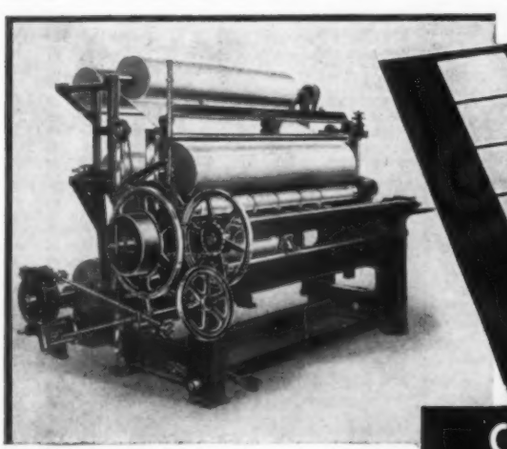

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CHEMICAL MARKETS

New York, Apr. 16, 1946
All Prices F.O.B. Works

ACCELERATORS

Organic			
A-1 (Thiocarbanilid)	lb.	.28	.33
A-10	lb.	.36	.42
A-19	lb.	.52	.58
A-32	lb.	.59	.69
A-77	lb.	.42	.55
A-100	lb.	.42	.55
Aldehyde ammonia, crystals	lb.	.65	.70
Altax	lb.	.39	.41
Beutene	lb.	.59	.64
B-J-F	lb.	.34	.39
Butasan	lb.	—	1.10
Butyl Zimate	lb.	—	1.10
Captax	lb.	.34	.36
Crylene	lb.	.40	.47
Di-Ortho-Tolyguanidine	lb.	.44	.46
Diphenylguanidine	lb.	.35	.41
El-Sixty	lb.	.36	.43
Ethasan	lb.	—	1.10
Ethyl Tuads	lb.	—	1.25
Ethyl Zimate	lb.	—	1.10
Ethylidine aniline	lb.	.42	.43
Formaldehyde aniline	lb.	.31	—
Guantal	lb.	.39	.48
Hepteen	lb.	.34	.39
Hexamethylenetetramine	lb.	.33	—
Lead Oleate, No. 999	lb.	.13	—
Witco	lb.	—	.16½
Ledate	lb.	—	1.20
Methasan	lb.	—	1.20
Methyl Tuads	lb.	—	1.25
Methyl Zimate	lb.	—	1.20
Monex	lb.	—	1.25
Pentex	lb.	.74	.84
Phenex	lb.	.49	.54
Pip-Pip	lb.	—	1.63
R & H 50-D	lb.	.42	.43
R-2 Crystals	lb.	—	1.55
Rotax	lb.	.44	.46
Safex	lb.	1.15	1.25
Santocure	lb.	.60	.67
Selenac	lb.	—	1.60
SPDX-G	lb.	.53	.58
Super-Sulfur No. 2	lb.	.13	.15
Thiocarbanilid, drums	lb.	.28	.33
Thiofide	lb.	.39	.46
Thiotax	lb.	.34	.41
Thiurad	lb.	—	1.25
Trimene	lb.	.54	.64
base	lb.	1.03	1.18
Triphenylguanidine	lb.	.45	—
Ulto	lb.	.99	1.04
Ureka	lb.	.50	.57
Blend B	lb.	.50	.57
Blend C	lb.	.48	.55
Vulcanex	lb.	.42	.43
Vulcanol	lb.	.85	—
Inorganic			
Litharge, domestic	lb.	.08	.08½
Magnesia, calcined, heavy	lb.	.08	.12

COLORS

Blues [b]			
Prussian	lb.	.36	—
Ultramarine	lb.	.17	.27
Browns [b]			
Mapico	lb.	.1135	—
Umber, Turkey	lb.	.04½	—
Greens [b]			
Chrome	lb.	.23	—
Guignet's Green	lb.	.70	—
Reds			
Antimony crimson, 15/17	lb.	—	—
Indian	lb.	.08¾	—
Domestic (Maroon)	lb.	.11	—
Mapico	lb.	.096	—
Red oxide, pure	lb.	.10	.12
Rub-Er-Red	lb.	.09¼	—
Whites [b]			
Cryptone No. 19	lb.	.0560	.0585
Cryptone CB No. 21	lb.	.0560	.0585
Cryptone ZS-800	lb.	.0825	.0850
Lithopone:			
Albalith	lb.	.04½	.04½
Astrolith	lb.	.04¼	.04½
Azolith	lb.	.04¼	.04½
Ray-cal	lb.	.05½	.05¾
Rayox	lb.	.14½	.15¼
Titanox A	lb.	.14½	.14¾
Titanox B	lb.	.05¾	.06
Titanox C	lb.	.05½	.05¾
Zinc Oxide—American Process [b]			
American Azo:			
ZZZ (lead free)	lb.	.07¼	.07½
Anaconda, lead free	lb.	.07¼	.07½
Horsehead Lead Free Brand:			
Special—3	lb.	.07¼	.07½
XX Red—4	lb.	.07¼	.07½
Kadox, black label—15	lb.	.07¼	.07½
Red label—17	lb.	.07¼	.07½
72	lb.	.07¼	.07½
St. Joe, black label	lb.	.07¼	.07½
green label	lb.	.07¼	.07½
red label	lb.	.07¼	.07½
U. S. P.—7, bbls.	lb.	.10½	.10¾
Zinc Oxide—French Process [b]			
Florence White Seal—7 bbl.	lb.	.09½	.09¾
Green seal—8	lb.	.09	.09¼
Red seal—9	lb.	.08½	.08¾
Yellows [b]			
Cadmolith	lb.	.55	.60
Chrome	lb.	—	.50
Mapico	lb.	.071	—

BLACKS
(In bags, carload lots)

Arrow Compact	.05¼	—
Atlantic	.05¼	—
Certified	.05¼	—
Certified Spheron	.05¼	—
Continental	.05¼	—
Disperso	.05¼	—
Dixiedensed	.05¼	—
Dixiedensed 66	.05¼	—
Excello	.05¼	—
Furnex	.03½	.06
Furnex Beads	.03½	.06
Gastex	.03½	.06
Kosmobile	.05¼	—
Kosmobile 66	.05¼	—
Kosmos-Dixie 20	.03½	.06
Micronex (Amarillo)	.05¼	—
Micronex Beads (Amarillo)	.05¼	—
Pelletex	.03½	.06
P-33	.04	.06½
Philblack A	.05	—
Sterling	.035	—
Supreme	.05¼	—
Thermax	.0225	.05
Wyex	.05¼	—

COMPOUNDING MATERIALS

Aluminum Flake	ton	18.00	24.50
99½%-300	ton	—	16.50
86-90%-300	ton	—	13.50
Asbestine	ton	16.50	20.00
Atomite	ton	—	27.50
Barium carbonate (98-100%)	ton	47.00	49.00
Barytes	ton	25.35	36.00
Bentonite	ton	11.00	16.00
Blanc fixe, dry	ton	60.00	67.00
Calcene	ton	37.50	43.00
Catalpo (fact)	lb.	.02	—
Clay, Aerfloted, Suprex	ton	11.00	23.50
Aerfloted Paragon	ton	10.00	22.50
Champion	ton	—	11.00
Crown	ton	—	11.00
Dixie	ton	11.00	23.50
Kaolloid	ton	—	9.00
Langford	ton	—	8.50
Magnolia	ton	—	10.00
McNamee	ton	10.00	22.50
Par	ton	—	11.00
Witco	ton	10.00	—
Kalite No. 1	ton	26.00	52.00
Kalvan	ton	100.00	126.00
Keystone white	ton	—	14.00
Magnesium carbonate	lb.	.06¼	—
Minerallite	ton	—	30.00
Pyrax A	ton	—	8.40
Rottenstone (powd. Dom.)	ton	25.50	37.50
Rubberol	lb.	—	.17½
Silene EF (calcium silicate)	lb.	.055	.06
Silical	ton	65.00	85.00
Snowflake white	ton	—	16.00
Talc, domestic	ton	14.50	—
Whiting, commercial	ton	16.00	26.00
Witco	ton	—	6.50
Witcarb R	ton	—	100.00
Witcarb R-12	ton	—	40.00
Wood Flour (100 mesh)	ton	30.00	32.00

MINERAL RUBBER

285°-300° Mineral Rubber	ton	25.00	27.00
Black Diamond	ton	25.00	—
Dielex	lb.	—	.06
Hard Hydrocarbon	ton	25.00	27.00
MilliMar	lb.	—	.05½

MISCELLANEOUS

Aromatics—Rodo #0	lb.	4.00	4.50
Rodo #10	lb.	5.00	5.50
Curodex 19	lb.	2.75	—
Curodex 188	lb.	3.50	—
Curodex 198	lb.	4.50	—
Para-Dors	lb.	4.50	—
Areskleno No. 375	lb.	.35	.50
Darvan (dispersing agent)	lb.	.30	.39
Santomerse S	lb.	.11	.25
Sponge Paste	lb.	—	.18
Sunproof	lb.	.22¼	.27¼
Tonox	lb.	.50	.59
Ty-Ply	gal.	6.75	8.75
Unicel (blowing agent)	lb.	.50	—

SOFTENERS

Acids			
Acetic, 28%, bbls.	100 lb.	3.38	3.63
Nitric, 36 degrees	cwt.	5.00	—
Acids, Fatty			
Laurex	lb.	.14½	.17¼
SL-20	lb.	.11	.13
Stearex Beads	lb.	.10	.11
Stearite	lb.	.10	—
Alkalies			
Caustic Soda, 76%	cwt.	2.70	5.70
Soda Ash, 58%	cwt.	1.15	2.98
Oils			
Degras, bbls.	lb.	.10	.12
Para-Flux	gal.	.17	.18
Para-Lube	lb.	.046	.048
Petrolatum, amber	lb.	.03¼	—
Pigmentaroil, tank cars	gal.	.20½	—
in drums	gal.	.26½	.27½
Pine, tanks [a]	gal.	.55	—
Rosin Oil, cmpd.	gal.	.40	—
Rubberol	lb.	.13½	.14
Rubtack	lb.	.10	—
Seedine, c.l.	lb.	.07¾	—
Witco Palm Oil	lb.	—	—
Witco Softener No. 20	gal.	.20	—
Woburn No. 8, c.l.	lb.	.06	—
Resins and Pitches			
Pitch, Burgundy	lb.	.08	—
coal tar	ton	19.00	22.00
hardwood	ton	16.00	22.50
pine, 200 lb. gr. wt.	bbl.	—	4.50
Pigmentar, tank cars	gal.	.20½	—
in drums	gal.	.26½	.27½
Retort Pine Tar, drums	gal.	.26½	.27½
Solvents			
Acetone, pure [a]	lb.	.07	—
Benzene, 90%, tank car	gal.	.14	—
Beta-Trichlorethane	gal.	—	.20
Bondogen	lb.	.98	1.25
Carbon, bisulfide	lb.	05	.08½
Carbon tetrachloride	gal.	.73	1.27
Dichlorethylene	lb.	—	—
Dipentene, cml., drums	gal.	.48	.50
Ethylene dichloride	lb.	.07½	.08½
Plastogen	lb.	.07¾	.12
Reogen (drums)	lb.	.11½	.15
Rub-Sol	gal.	.09½	—
Trichlorethylene	lb.	.08	.09½
Turpentine, steam dist., drums	gal.	.80	.83
Waxes			
Antisol	lb.	.22½	.23½
Beeswax, white [a]	lb.	.58	—
Carnauba, yellow [a]	lb.	.83¼	—
Ceresin, white, dom.	lb.	.13½	.15
Montan, dom.	lb.	.30	.35
Paraffin [a]			
Yellow crude scale, 124/126	lb.	.04½	—
Refined, 120/122	lb.	.05¼	—

ANTI-OXIDANTS

Agerite Alba	lb.	1.95	2.05
Gel	lb.	.52	.54
Hipar	lb.	.61	.63
Powder	lb.	.40	.42
Resin	lb.	.43	.45
Resin D	lb.	.40	.42
White	lb.	1.23	1.33
Albasan	lb.	.69	.74
Antox	lb.	.54	.56
B-L-E	lb.	.40	.49
Flectol H	lb.	.40	.47
Neozone A, C, D, E	lb.	.40	.63
Oxynone	lb.	.77	.90
Retardex	lb.	.44½	.47½
Santoflex B	lb.	.40	.47
Santoflex BX	lb.	.54	.61
Santovar O	lb.	1.15	1.40
S.C.R.	lb.	.32	.34
Stabilite	lb.	.48	.50
Stabilite Alba	lb.	.69	.74
VGB	lb.	.43	.52

EXTENDERS

Naftolen R-100	lb.	.10	.12

LUBRICANTS—MOLD & RUBBER SURFACE

Areskleno	lb.	.35	.50
Cocoa Soapstock	lb.	.06	.08
Colite	gal.	.90	1.15
Dipex	lb.	.06	.08
Glycerized Liquid Lubricant	gal.	—	1.35
Lubrex	lb.	.25	.30
Mineralite	ton	—	30.00
Sericite	ton	65.00	75.00
Soap Tree Bark, cut, sifted	lb.	.06	.08

FACTICE OR RUBBER SUBSTITUTES

Amberex	lb.	.25	—
Amberex Type B	lb.	.18¾	—
Black	lb.	.08½	.13
White	lb.	.09	.15
Brown	lb.	.10	.14
Neophax A	lb.	.16½	—

VULCANIZING INGREDIENTS

Dispersed Sulfur No. 2	lb.	.08	.12
Sulfur Chloride, yellow (drs.)	lb.	.03	.08½
Sulfur, rubber makers			
Refined (bags)	cwt.	2.55	—
Commercial (bags)	cwt.	2.20	—
Telloy	lb.	1.75	—
Vandex	lb.	1.75	—
Vultac No. 1	lb.	.38	.43
Vultac No. 2	lb.	.38	.43
Vultac No. 3	lb.	.42	.49

[a] Price Ceilings.
[b] Price Suggestions or Agreements.

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POSITION WANTED AS FACTORY MANAGER OR PLANT SUPERINTENDENT. Experienced in compounding, milling, calendering, extruding, and molding of all synthetic and rubber tires, tubes and mechanical rubber goods. Mechanical molded and extruded goods a specialty. Know cost and modern methods of processing. Can take complete charge of factory. Address Box 2106, RUBBER AGE.

TECHNOLOGIST versed equally well in Petroleum and Rubber wants position which is largely administrative, supervisory, or technical sales. Bachelor and Master of Arts in Petroleum Engineering, plus two years toward Doctorate in Organic Chemistry; Five years teaching in Universities; Eleven years research chemist and technical Superintendent Petroleum refineries; Excellent record, nine years as Principal Engineer (Rubber) for Navy Department, member Phi Lambda Upsilon, Sigma Xi, thirty-four publications (rubber), fourteen Patents (Petroleum and Rubber); Protestant, Age forty-six, married. Salary six to eight thousand, depending on circumstances and location. Address Box 2111, RUBBER AGE.

A GOOD MAN FOR YOU??? 15 years' experience. Last eight national rubber manufacturer. Top-management, sales management, coordinating departments. Thirty-seven, healthy, college, a real worker. Good planner, leader, go anywhere as branch manager, salesman or executive. Will make profits for you. Now employed. Desire return to rubber field. Address Box 2117, RUBBER AGE.

PRODUCTION—SALES

Thoroughly experienced in development and processing of natural and synthetic rubber goods, especially heels, soles, slabs, molded and extruded products. Some 20 years practical and technical background, including compounding and factory management. Will also consider selling job on compounding ingredients. Prefer New York or New England, but will consider other territory. Mainly interested in good connection providing future growth. First class references. Address Box 2127, RUBBER AGE.

CHEMIST, B.Sc. Seven years' experience laboratory rubber compounding, testing, development, also plastic formulating, compression, injecti onmolding, extrusion, and testing. All in supervisory capacity. Desires responsible position in any relevant phase of rubber or plastic field. Location secondary. Address Box 2128, RUBBER AGE.

RUBBER EXECUTIVE: Well known with over thirty years' experience former small plant owner, desires position as sales representative for chemical or allied industry. Prefer Ohio, Western Pennsylvania. Age 47. Address Box 2135, RUBBER AGE.

INDUSTRIAL ENGINEER presently employed, experience rubber compounding and plant operation, desires responsible position with progressive organization development and laboratory work or production supervision. Eastern States location. Address Box 2136, RUBBER AGE.

LABORATORY DIRECTOR: Man with 18 years' experience in Rubber and Plastics. Desires position in executive capacity as Laboratory Director, Sales Engineer, Technical Service, or Factory Manager of medium size or small company. College trained. Experience includes mechanicals, belting, packing, sundries, hose, molded goods, mandrel cut goods, coatings, abrasive plastics, proofing, soles, heels, and plumbing supplies. Able compounder, research engineer, fully acquainted with latest testing equipment and methods. Has initiative, vision, ability, and record of accomplishments. Member of numerous technical Societies. Qualified executive ability. Family. Address Box 2137, RUBBER AGE.

HELP WANTED

CHEMIST with some compounding experience on soles and heels. Permanent position with large nationally known company. Outstanding opportunities for advancement. State age, education, experience, including previous and present employment, and starting salary desired. Address Box 2034, RUBBER AGE.

RUBBER CHEMIST, experience in compounding and processing of all types of rubber. Preferably with knowledge of plastics. Address Box 2131, RUBBER AGE.

FACTORY MANAGER and SUPERINTENDENT with complete and up-to-date knowledge of milling, compounding, calendering, extruding, manufacture of molded rubber articles. We need a man to take complete charge of manufacturing. Address Box 2133, RUBBER AGE.

CHEMIST with research ability for progressive rubber and plastic manufacturer. Good salary, wonderful opportunity for advancement. Reply giving experience and salary expected. Address Box 2138, RUBBER AGE.

CHEMIST for formulating and research work on Pyroxalin, Vinylite and other types of flexible coatings. Must be familiar with application of these coatings to rubber, cloth, or paper and also be able to perform sales service duties. Address Box 2107, RUBBER AGE.

SALES STATISTICIAN—young college-trained man or woman to organize and maintain sales statistics department by large, independent middle-western tire and tube manufacturer. Advise education, business experience, salary record and family status in first letter. Address Box 2108, RUBBER AGE.

TIRE FINISHING SUPERVISOR—Opening for man with experience in supervising duties connected with cured tire final finishing. Position offers excellent opportunity for advancement. All replies confidential. Address Box 2093, RUBBER AGE.

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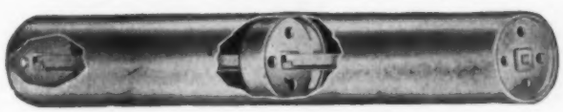

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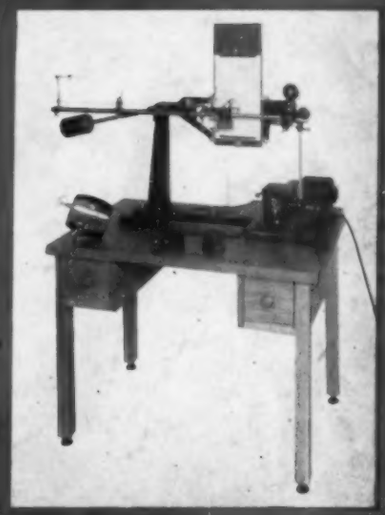

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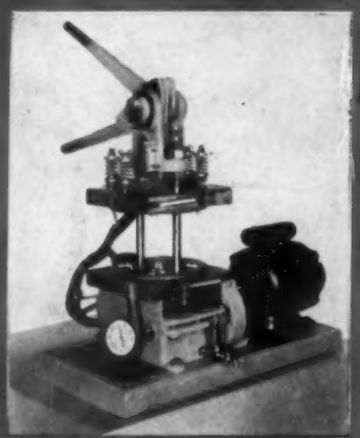

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